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The Demography of Islamic Nations

By John R. Weeks

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Abstract—The Moslem population of the world is estimated at 984 million persons in 1988; almost one-quarter of the world population may be Moslem after the turn of the century if current high levels of fertility persist. There are more Moslems today in Asia and sub-Saharan Africa than in the Arab Middle East where Islam arose in the 7th century A.D.

The Islamic nations are the fastest growing population group worldwide—through natural increase, not conversion—although Islam is the only major monotheistic religion not to forbid contraception. Almost all Islamic countries have very high levels of fertility, mortality, and natural increase even though there is wide diversity among them, stretching as they do from Albania in Europe to the world's fifth most populous nation, Indonesia in Southeast Asia, and ranging from the wealth of the oil-producing states in the Gulf and Brunei to the poverty in densely-populated Bangladesh and drought-stricken countries in Africa.

The author argues that it is not Islam per se that causes these demographic trends, but the generally early stage of development and the low status of women in traditional, patriarchal societies.

There are 40 countries in which 50-100 percent of the population is Moslem; 7 in which 25-49 percent are Moslem; and 9 countries with over 2 million Moslems each but where they do not total 25 percent of the population. These include China, India, the Soviet Union, and Yugoslavia, countries where ethnic and religious divisions often create political problems.

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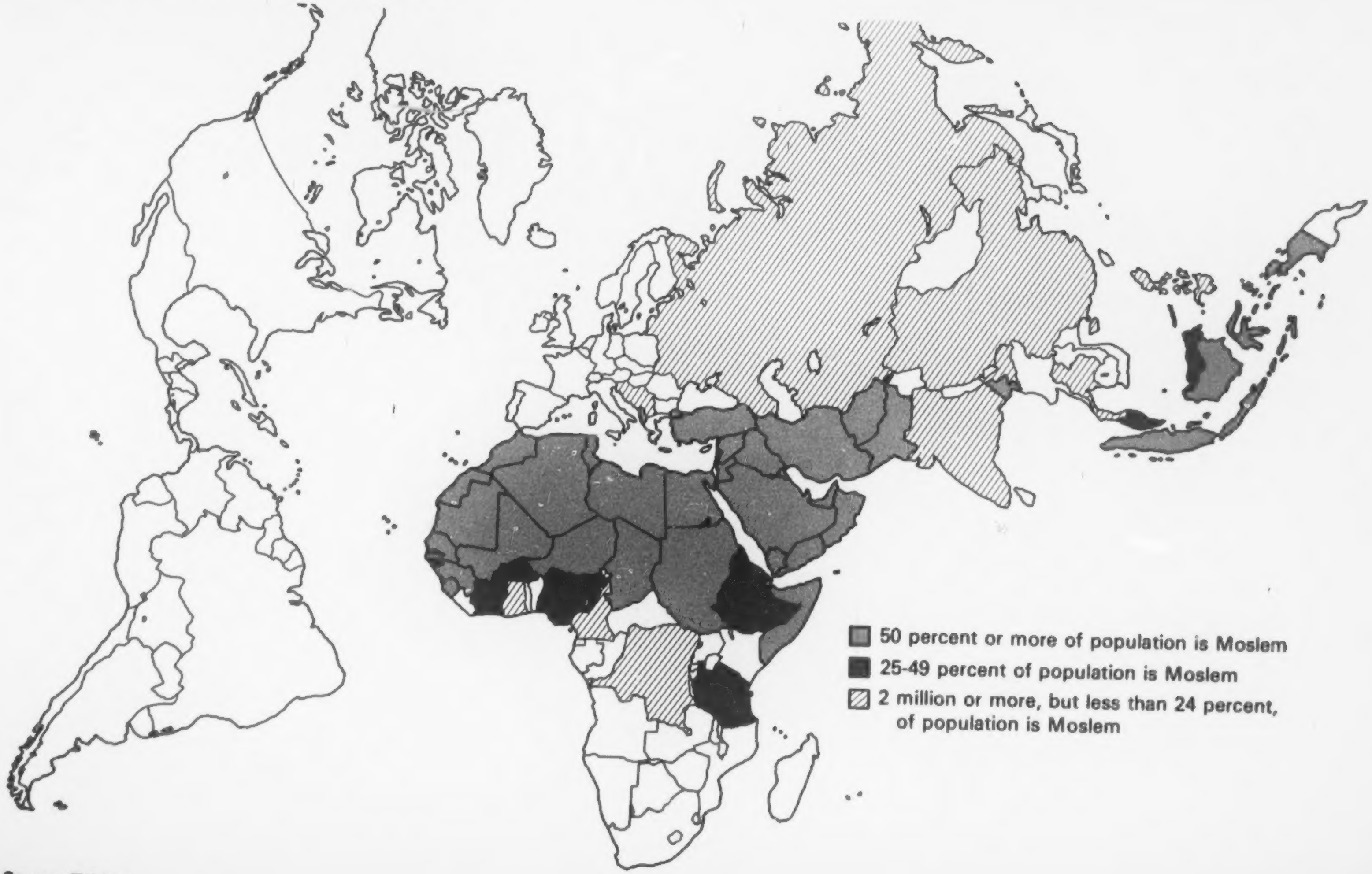
Figure 1. Islamic Nations, 1988


▨ 50 percent or more of population is Moslem
■ 25-49 percent of population is Moslem
▨ 2 million or more, but less than 24 percent, of population is Moslem

Source: Table 1

The Demography of Islamic Nations

By John R. Weeks

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The Islamic nations are the world's fastest growing population group. Nearly 1 in every 5 human beings is Moslem,* and there are Moslems residing in virtually every nation of the world. Indeed, there are more Moslems in Southern and Southeastern Asia and in sub-Saharan Africa than in the Arab countries of the "Middle East" where Islam arose.

At current rates of growth, the 1988 estimated population of some 980 million Moslems could nearly double to 1.9 billion before the year 2020, accounting then for 23 percent of the world's total.[1] Although Islam is a proselytizing religion, its proportionate increase in the modern world is much more a result of natural increase (the excess of births over deaths) than it is the conversion of non-Moslems to the Islamic faith. The nations of Islam tend to be farther behind in the demographic transition from high to low birth and death rates than other major categories of nations. As a group, they have the highest fertility levels (with only a few signs of an impending decline), the highest mortality (although declining), and some of the highest rates of natural increase.

This *Bulletin* examines the demographic dynamics of the Moslem world, focusing analysis especially on the causes and consequences of the rapid rate of population growth in those nations in which a significant fraction of the population follows the Islamic faith.

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*There is no universally accepted transliteration of Arabic script into the Latin alphabet. We will follow the predominant American usage of, for instance, Moslem and the Koran, rather than Muslim and the Qur'an.

What is Islam?

A Moslem is one who has "submitted" (the literal translation of *Islam*), "committed" to God and has accepted the Islamic creed that "There is no god but Allah, and Mohammed is the messenger of Allah." Like Jews and Christians, Moslems are monotheists, and all three groups share in common the prophets of the Old Testament. Moslems accept Jesus Christ as a prophet and even acknowledge his virgin birth, but they do not accept his divinity. Nor do they believe Mohammed divine—to Moslems he is the last prophet through whom God revealed his Word. Judaism rejects both the divinity of Jesus and the idea that Mohammed was the last chosen prophet of God.[2]

The fount of Islam is Saudi Arabia, the birthplace of the Prophet Mohammed in the late 6th century A.D. That country has two holy cities: Mecca, where Mohammed was born and received God's revelations and which is also the site of the Kaaba—the Islamic shrine that incorporates the large Black Stone that had been holy to Arabs even before Mohammed's era (and to which Moslems turn in prayer); and Al-Medina (literally, "the City"), to which Mohammed migrated after being initially ostracized in Mecca for preaching the new Word of God. That migration (*hejra*) occurred in A.D. 622, which is used as the first year of the Moslem lunar calendar.

From its roots in the Arab world, Islam spread quickly in virtually every direction, as far west as the Atlantic Coast of Africa, as far east as Indonesia, and as far north as the gates to the city of Paris. The historical peak of consolidated Islamic political strength was the Ottoman Empire. The Turks had accepted Islam in the 10th century and by the 15th century had built an Islamic empire that virtually ringed the Mediterranean. Ottoman power began to crumble in the 17th century as European colonization picked up steam, and ended officially in 1923 with the proclamation of the secular (albeit Moslem) Republic of Turkey, However, the decline of the political empire was not accompanied by a decline in the number of Moslems. Islam has continued to spread throughout the world.

The core of religious behavior for Moslems is embodied in the Five Pillars of Islam: (1) the creed (*al-Shehada*) that "There is no god but Allah, and Mohammed is the messenger of Allah;" (2) regular prayer; (3) giving alms; (4) fasting during the daylight hours of the month of Ramadan; and (5) undertaking a pilgrimage (the *Haj*) to Mecca (for those who can afford it). Moslems are further bound by the regulation of everyday life prescribed by the *Sharia* (the "way" or "the straight path")—the Islamic law covering both religious and civil activities (in classical Islam there is no difference between the two). The Sharia draws primarily from the Koran (the Word of God as revealed to Mohammed), as well as from the *sunna* and *hadith* (the collection of traditions and sayings of Mohammed), the *qiyas* (body of reasoning developed by jurists over time), and the *ijma* (consensus of a group of judges representing a Moslem community). Religious courts administer the Sharia, and in an officially Islamic nation such as Iran or Saudi Arabia, are the only courts in the land. In most Islamic nations, however, there are two sets of laws—secular and religious—governing different but complementary aspects of people's lives. We might note that the fundamentalist movement within modern Islam rests primarily on the attempt to establish Islamic republics in which the Sharia is the only governing law.

There are two major Moslem groups—the Sunni and the Shia (Shiite Moslems). The origin of their difference lies largely in their belief as to who should lead Islam after the death of the Prophet Mohammed. Sunni Moslems endorse Abu Bakr who was elected Caliph ("leader"); he was a faithful friend and the first convert to Islam. Shias believe that Mohammed's son-in-law Ali (also a cousin and close friend of the Prophet) should have been chosen Caliph. The majority of Moslems in the world today are Sunnis, but Shiism is the major minority sect and forms the majority in two Islamic societies—Iran and Iraq, although in Iraq the minority Sunnis control the government. The Shiites in Iraq are, not coincidentally, concentrated in the eastern part of the country that borders Iran. Shiite Moslems are also a majority among Moslems in Lebanon, but they do not represent a majority of the total Lebanese population (which has a large Christian minority).

There is no central authority in Islam, and therefore no Moslem hierarchy or bureaucracy. This leaves leadership open to local clerics who may or may not have formal training, but who live among and work with a local community and mosque and may gain considerable prestige and clout. In the Arab world and Iran, the religious leaders are usually called *imam* or *sheikh*, whereas farther east, in Afghanistan, Pakistan, and India they are more often called *mullah*, and they hold the title *mallam* in West Africa.

Islam is far more than a religion—it is a complete way of life. Sharia governs virtually every aspect of human existence, although in practice Islam has been quite adaptable to local customs. Nonetheless, the maintenance of a worldwide community of Moslems is one of the underlying goals of Islamic life, exemplified in particular by the pilgrimage to Mecca, which serves to underscore to each pilgrim the vast reach of the faith and the communality of its followers. Of special interest to the demographer are those aspects of Islam that govern marriage and family life, including the social relationships between males and females.

Social Relationships in Islam

Islam very strongly promotes marriage for whomever can afford it. Prophet Mohammed referred to marriage as "half of the religion" and said, "Marriage is my tradition. He who rejects my tradition is not of me." Marriage is a contract that gives the partners the legitimate status of a family and establishes the legal and moral rights and duties of the couple and their children. To prevent women from being forced into marriage, Islam specified that free consent of the woman is a prerequisite to marriage. Divorce is considered to be very undesirable in Islam, but it is far easier for a male to initiate a divorce than for his wife to do so.

Islam supports the dominance of males in society, although the Sharia requires fairness and compassion for females. An Islamic society is patriarchal, with the stipulation that both males and females always belong to their patrilineal kinship group; the eldest male has full authority over the family. It is important, however, to keep the issue of male dominance in historical perspective. In a world in which women were often little more than chattel or slaves, Islam accorded to women secure legal rights including independent legal status, the right to own and dispose of property, and the right to receive a share of inheritance (half as much as the male members of the family). "The position of women in Islam is inferior to that of the male, yet it is far superior to their position among animists prior to the coming of Islam. In Arabia, Islam stopped the common practice of female infanticide, reduced the multiplicity of wives to four, and stipulated that each wife must be treated equally."[3] The dominance of men is accompanied by their paternalistic attitude toward women, as well as by their "deep concern for the sexual purity of their daughters and the constancy of their wives."[4] In many Islamic societies, this often leads to the arranged, early marriage of daughters, along with the seclusion of women in the home (*purdah)*, and the veiling of women in public. In exchange, men are obligated to provide for all of the women (including the unmarried, divorced, and widowed) and children in the family.

Defining Islamic Nations

There are 40 nations in the modern world in which a majority of the population is Moslem, according to the best available estimates (see Table 1 and Figure 1, p. 4). In a handful of cases, such as Iran and Saudi Arabia, the Sharia is the complete and only law of the land. There are several countries, such as Algeria and Pakistan, in which Islam is the declared official state religion, even though some aspects of secular rule involving matters of state and sentencing of criminals may complement Sharia rule. These 40 Moslem-majority countries are the core of the Islamic world.

There are an additional seven countries in which a significant minority—25 to 49 percent—of the population is Moslem. Statistical analysis of several combinations of major demographic variables (including crude birth rate; crude death

Table 1. Islamic Nations, 1988

Country	Percent Moslem	Total 1988 Population	Moslem Population
		(millions)	
I. Countries in which a majority of the population is Moslem:			
Comoros	100	0.4	.427
Maldives	100	0.2	.203
Western Sahara	100	0.2	.181
Afghanistan	99	14.5	14.336
Algeria	99	24.2	23.953
Bahrain	99	0.5	.500
Mauritania	99	2.1	2.049
Morocco	99	25.0	24.726
Oman	99	1.4	1.358
Saudi Arabia	99	14.2	14.044
Somalia	99	8.0	7.910
Tunisia	99	7.7	7.692
Turkey	99	52.9	52.452
North Yemen	99	6.7	6.665
South Yemen	99	2.4	2.402
Gaza	98	0.6	.563
Iran	98	51.9	50.886
Libya	98	4.0	3.877
Pakistan	97	107.5	104.243
Iraq	96	17.6	16.880
Kuwait	96	2.0	1.881
Qatar	95	0.4	.394
Jordan	93	3.8	3.573
Egypt	91	53.3	48.600
Senegal	91	7.0	6.354
Djibouti	90	0.3	.288
United Arab Emirates	90	1.5	1.338
Indonesia	88	177.4	156.136
Gambia	87	0.8	.678
Niger	87	7.2	6.305
Syria	87	11.3	9.864
Bangladesh	85	109.5	93.050
Mali	80	8.7	6.933
Sudan	72	24.0	17.291
Albania	70	3.1	2.203
Guinea	69	6.9	4.788
Brunei	64	0.3	.166
Lebanon	60	3.3	2.003
Chad	51	4.8	2.437
Sierra Leone	50	4.0	1.982
Total	91	771.6	701.611

rate; total fertility rate; infant mortality rate; life expectancy; the ratio of men to women enrolled in secondary schools; and the percentage of brides who are under age 20) revealed that the Moslem-minority nations are much more similar demographically to the Moslem-majority nations than they are to other developing nations. Based on this finding, we have included the Moslem-minority nations (listed in section II of Table 1 and shown in Figure 1) among the nations of Islam.

There are also nine countries in which the proportion of the population that is Moslem is less than 25 percent, but in which the Moslem population numbers 2 million or more (a size that we have somewhat arbitrarily termed "significant"). China, India, and the Soviet Union are the more notable examples in this category, and these countries are listed in section III of Table 1 and are also shown in Figure 1. Statistical analysis did not reveal a consistent pattern of these countries being more like Islamic nations than like other nations, and so they are not included in our analysis of Islamic nations, although they clearly

II. Countries in which a significant minority (25–49 percent) of the population is Moslem:			
Malaysia	49	17.0	8.314
Nigeria	45	111.9	50.357
Burkina Faso	44	8.5	3.734
Guinea-Bissau	38	0.9	.359
Ethiopia	35	48.3	16.941
Tanzania	30	24.3	7.289
Côte d'Ivoire	25	11.2	2.796
Total	40	222.1	89.790
III. Countries in which a significant number of people (2 million or more) is Moslem, even though they represent less than 25 percent of the total population:			
Cameroon	22	10.5	2.317
USSR	17	286.0	49.464
Yugoslavia	16	23.6	3.773
Ghana	15	14.4	2.168
India	11	816.8	89.034
Zaire	10	33.3	3.330
Philippines	6	63.2	3.539
Thailand	4	54.7	2.189
China	1.5	1,087.0	15.870
Total	7	2,389.5	171.684
Total for Islamic Nations	29	3,383.2	963.085
Other Moslem populations*			20.461
World Total	19.2	5,128.0	983.546

*Other Moslem populations (country, percent Moslem, number Moslem in millions): Belgium (0.7%) .069; Benin (16%) .720; Bhutan (5%) .075; Bulgaria (11%) .988; Burma (3.6%) 1.479; Burundi (1%) .052; Canada (0.6%) .157; Central African Republic (8%) .221; Cyprus (18.5%) .127; Equatorial Guinea (0.7%) .002; Fiji (8%) .059; France (1%) .559; Gabon (1%) .013; Greece (2.5%) .252; Guyana (9%) .069; Hong Kong (0.5%) .028; Israel (12.5%) .554; Kampuchea (2.4%) .160; Kenya (6%) 1.401; Liberia (21%) .517; Madagascar (2%) .218; Malawi (16%) 1.229; Mauritius (17%) .187; Mayotte (98%) .068; Mongolia (9.5%) .194; Mozambique (13%) 1.967; Nepal (5%) .913; Panama (4.5%) .104; Reunion (2.4%) .013; Romania (1.2%) .276; Rwanda (8.6%) .607; Singapore (18.3%) .483; South Africa (1.2%) .421; Sri Lanka (8%) 1.331; Suriname (14%) .055; Taiwan (0.5%) .099; Togo (16%) .534; Trinidad and Tobago (6.5%) .083; Uganda (6.6%) 1.086; United Kingdom (1.4%) .799; United States (0.6%) 1.477; Vietnam (1%) .652; Zambia (1%) .075; Zimbabwe (0.9%) .088.

Sources: The principal source of data on the percentage of the population that is Moslem is Richard V. Weekes, *Muslim Peoples: A World Ethnographic Survey*, 2nd edition, (Westport, CT: Greenwood Press, 1984) appendix I; updated by Mark S. Hoffman, ed., *The World Almanac and Book of Facts 1988* (New York: Pharos Books, 1987) pp. 650-738; 1971 Census of Indonesia and the 1974 Census of Bangladesh; Population Reference Bureau, *1988 World Population Data Sheet*

Box 1. Moslems as Minorities in the Soviet Union and China

Nearly 20 percent of Moslems (approximately 172 million) are living in nations where they are clearly in the minority, as noted in Table 1. The conflict between Hindus and Moslems in India is a regular news headline, but less is commonly written about Moslems in other nations. Outside of India, the largest Islamic minority population is in the Soviet Union, where there are an estimated 49 million Moslems, representing about 17 percent of the total Soviet population. Although there are more than 100 different ethnic groups within the borders of the USSR, 36 of them are of Islamic origin.[1] For the most part they inhabit the southwestern corner of the Soviet Union, in territory that for centuries was part of the Ottoman Empire but which was absorbed by the Soviets after World War I.

Of particular demographic importance is the fact that the Moslem population in the Soviet Union has been growing far more rapidly than the Russian population (see Table).

In the 1970s Moslems were increasing at a rate that was four times greater than the Russian population, whereas between 1929 and 1959 the Russians had been increasing more rapidly than Moslems. The Russian population has passed through the demographic transition earlier than has the Moslem population, in a classic mirroring of the worldwide difference between the transitions experienced by developed societies (in this case the Russians) and a developing society (in this case the Soviet Moslem minority). Mortality is now dropping among Moslems, but fertility remains high. The Russian population, by contrast, has already traversed the entire demographic transition to low fertility and mortality. For Soviet planners, the rapid population increase among all minority groups, including Moslems, has presented a set of policy dilemmas, since Russians tend to dominate the political and military institutions of Soviet society. Members of minority groups are clamoring for increased access to society's resources.[2]

In China, Moslems account for only an estimated 1.5 percent of the population, but that still leads to a Chinese Moslem population of 16 million. Of the officially recognized 55 minority nationalities in China, the Hui and the Uygur represent the numerically largest predominantly Moslem groups, accounting for about 80 percent of all Moslems in the country.[3] There are an additional eight predominantly Islamic ethnic groups which account for the remainder of the Chinese Moslem populations, including the Kazak, Ozbek, Tajik, Tatar, Kirgiz, Salar, Dongxiang, and Bonan. In general, the Chinese Moslem population seems to

Percentage Increase in Population

	1929-59	*1959-70*	*1970-77*
Total Soviet Union	42	16	8
Russians	47	13	6
Moslems	41	45	23

Source: Alexandre Bennigsen and S. Enders Wimbush, *Muslims of the Soviet Empire* (London: C. Hurst and Company, 1985) Table 6.3

defy demographic generalization, because the differences among groups are much more noticeable than are the demographic similarities. The largest group, the Hui, numbers about 7.2 million persons and geographically is widespread throughout the country. They tend demographically to be more like the Han majority than almost any other minority group except Koreans. Data from the 1982 Census of China show an average number of children ever born of 2.81 per women, with 33 percent of women of reproductive age being childless and 11 percent having only one child. By contrast, the Uygur, who number 5.9 million, are heavily concentrated in the northwest corner of China (bordering the predominantly Moslem area of the Soviet Union). They average 3.49 children per woman, and 27 percent of the women are childless, while 11 percent have only one child. Compared with the Hui, the Uygur are more rural and have a lower life expectancy. Minorities have been exempt from the "one child" policy.

The apparent demographic differences between Moslem minorities in China and in the Soviet Union serve as a reminder that generalizations are hard to support when it comes to examining the specific impact of Islam on demographic behavior.

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represent a part of the Moslem world.

Geographically, the largest number of Islamic nations is in what is usually called the "Middle East" (a term first used in the *National Review* of London in 1902 by the American naval historian Alfred Thayer Mahan and picked up by journalists during World War II). That region, as used here, includes North Africa (where all seven nations of that region are Islamic) and Western Asia (where every nation but Israel and Cyprus is Islamic).[5] Table 2, p. 12, shows that these 22 Middle Eastern nations have a combined population of 309 million people and encompass 31 percent of the population of Islamic nations—a plurality, but not a majority. Sub-Saharan Africa has an additional 17 Islamic nations with a combined population of 255 million, representing nearly 26 percent of the population of the Islamic nations. Southern Asia holds 232 million people in just four nations, led by the 110 million in Bangladesh and 108 million in Pakistan. Southeast Asia has three Islamic nations, including the fifth most populous nation in the world—Indonesia. Finally, Albania is the only nation in Europe with a Moslem majority, although its neighbor, Yugoslavia, with a much lower fraction of Moslems, has a larger Moslem population.

With the exceptions of Albania in Europe and Tanzania in East Africa, all Islamic nations to the west of Bangladesh are physically contiguous to at least one other Islamic nation. Bangladesh is an island of Islam in a sea of Hinduism and Buddhism, and Indonesia is, more literally, islands of Islam in the Indian Ocean. Indonesia is the most populous nation of Islam, with a total of 177 million people, 88 percent of whom are estimated to be Moslem. The island of Borneo is shared by three nations of Islam—Indonesia, Malaysia, and Brunei. Thus, the Islamic population of Southeast Asia is concentrated in a contiguous set of islands.

Islam arrived in the East Indies through Arab traders who had been sailing the

Table 2. Islamic Nations by Geographic Region

Region	Number of Countries	1988 Total (millions)	Percent of Islamic Total
Middle East			
Northern Africa	7	138.4	13.9
Western Asia	15	170.5	17.2
Sub-Saharan Africa	17	255.3	25.7
South Asia	4	231.7	23.3
Southeast Asia	3	194.7	19.6
Europe	1	3.1	.3
Total	47	993.7	100.0

Source: Table 1

Asian routes even prior to the advent of Islam.[6] Islam replaced Hinduism and other local religions in Indonesia from the 15th century, but a blending process took place in which many adherents to Islam incorporated into that faith elements of their own previously held group beliefs. This appears to have been true especially in rural areas that had previously been largely Hindu. This blending process, which is aided by the ability of Islam to adapt to local customs, may help to account for the picture that will emerge in this report in which Southeast Asia will be seen demographically to be somewhat different from other nations of Islam. Indeed, this serves as a precursor to a point that will be made repeatedly throughout this study: Regional and ethnic distinctiveness in demographic profiles is often more noteworthy than distinctions made on religion. Let us examine the shapes of those demographic profiles.

The Demographic Distinctiveness of Islamic Nations

The nations of Islam, both individually and as a group, are characterized by higher-than-average fertility, higher-than-average mortality, and rapid rates of population growth. The numbers are presented in Table 3, in which the nations of the world are divided into four different categories: (1) Islamic nations (virtually all of which are developing nations); (2) other developing nations; (3) nations with centrally-planned economies (except Albania, which is an Islamic nation);[7] and (4) developed nations. The 47 Islamic nations have an average[8] crude birth rate (CBR) of 42.1 live births per 1,000 population—25 percent higher than the average for other developing nations, 181 percent higher than the nations with centrally-planned economies, and 221 percent higher than in developed nations. This high birth rate reflects a total fertility rate (TFR) of 6.0 implied lifetime births per woman, compared with "only" 4.5 in other developing nations, 2.1 in nations with centrally-planned economies, and 1.7 (below replacement level) in the developed nations.

The average crude death rate (CDR) for Islamic nations is 13.8 per 1,000 population, which is 37 percent higher than other, non-Moslem developing countries, 19 percent higher than the countries with centrally-planned economies, and 47 percent higher than the developed nations. These death rates reflect average life expectancies at birth of 55 years in Islamic nations, compared with 62 in other developing nations, 70 in the nations with centrally-planned economies, and 75 in developed nations. Especially noteworthy are the differences in infant mortality. A newborn baby in the average Islamic nation has a ten times greater chance of dying in infancy than one born in a developed society.

Despite the high mortality, the very

high birth rate in Islamic countries translates into the world's most rapidly growing population group. Nations of Islam are growing at an average of 2.8 percent per year (implying that their population would only take 25 years to double in size), which is 22 percent faster than the other developing nations (whose doubling time averages 30 years), and 833 percent faster than developed nations, whose doubling time averages 233 years, based on natural increase only and excluding the impact of migration.

Islamic nations can thus be characterized as generally being in the early phase of the demographic transition leading to low fertility and low mortality. Death rates are declining (even though they represent the world's highest levels), but fertility remains very high. Figure 2, p. 14, compares the demographic transition as it occurred in the United States with the current situation in Islamic and other developing nations. The United States has moved through time from an estimated crude birth rate of 55 per 1,000 in 1800 (when the crude death rate was probably above 20 per 1,000) down to the present situation of the CBR at 16 and the CDR at 10 per 1,000 population. The birth rate, of course, bumped up along the way to produce the baby boom of the mid-1940s to mid-1960s. Anchoring our comparisons of the CDR, the average crude death rate in Islamic nations today of approximately 14 per 1,000 is comparable to the situation in the United States at about the time of World War I. On the other hand, you have to go back to the mid–1800s in the U.S. to find a CBR as high as the 42 per 1,000 that is the average for nations of Islam today.

The extremes with respect to fertility in the Islamic world today are represented by a high in the Yemen Arab Republic

Table 3. Demographic Characteristics of Islamic Nations, Compared With Other Nations of the World, 1988

Demographic Characteristic	Islamic Nations	Other Developing Nations	Centrally-Planned Economies	Developed Nations
Number of Nations	47	94	7	25
Average population size (millions)	21.2	30.3	57.0	31.8
Average Crude Birth Rate per 1000 population	42.1	33.6	15.0	13.1
Average Crude Death Rate per 1000 population	13.8	10.1	11.6	9.4
Average Rate of Natural Increase	2.8%	2.3%	0.4%	0.3%
Average Total Fertility Rate	6.0	4.5	2.1	1.7
Average life expectancy (years)	55	62	70	75
Average Infant Mortality Rate per 1000 births	104	63	18	10
Average percent of population under age 15	43	39	23	20
Average percent urban	40	43	64	74

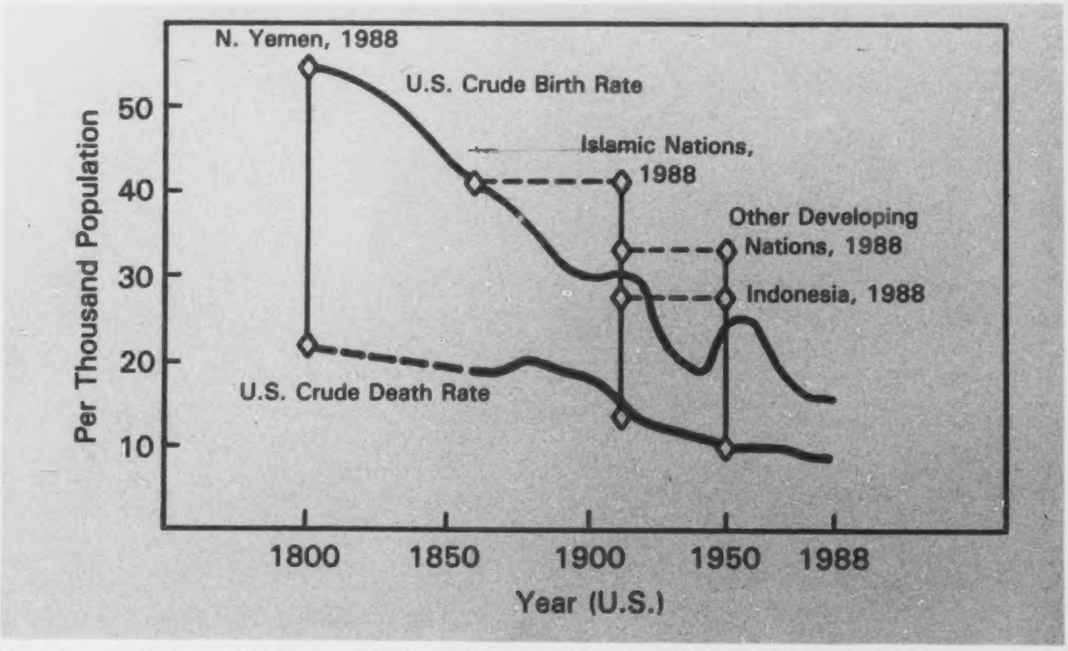
Note: Data are not available for all countries for each characteristic.

Source: Population Reference Bureau, *1988 World Population Data Sheet*

(North Yemen) and a low in Indonesia. In North Yemen, the crude birth rate (55 per 1,000) and crude death rate (22 per 1,000) are similar to the figures prevailing in the United States in 1800, and are probably representative of the demographic profile of the U.S. population at the time of the American Revolution. On the U.S. time scale, Indonesia's mortality level (CDR of 10 per 1,000) is a century and a half more modern, being comparable to the U.S. situation as recently as 1970, although the Indonesian crude birth rate (27 per 1,000) is more comparable to the U.S. experience just after the First World War. The average for other developing nations is much closer to the Indonesian conditions than it is to the Yemeni situation, as shown in Figure 2. Crude death rates are similar to those of the U.S. in 1970, whereas crude birth rates as high as 34 have not been experienced in the U.S. since the latter part of the 19th century.

This general demographic description of the nations of Islam can be rounded out by observing that the high rates of fertility lead to very young populations in Islamic nations—an average of 43 percent of the population is below the age of 15. This is higher than the average for other developing nations and is much higher than in countries with centrally-planned economies or in the more developed nations of the world. Islamic nations are also among the most rural in the world—averaging 40 percent urban—compared with 43 percent for other developing nations, and 74 percent in the developed nations. On the other hand, the presence of oil-producing nations in the Islamic world skews the national average per person income in Islamic nations. The high-income oil-exporting nations of Saudi Arabia, Kuwait, United Arab Emirates, Brunei, Qatar, and

Figure 2. The Demography of Islamic Nations Compared to Other Developing Countries and the Demographic Transition in the U.S.



Sources: U.S. Bureau of the Census; Population Reference Bureau, *1988 World Population Data Sheet*

Oman, by the way, statistically average $11,357 per person per year (not including Libya, for which income data are not available), which is almost identical to the per person income level of Western Europe ($11,380).

The seven nations in which oil is the major economic product are much smaller in population than the average Islamic nation—averaging only 3.4 million, compared with 24.2 million for the other Islamic nations—and they have slightly higher rates of population growth—2.9 percent compared with 2.8 percent for the non-oil-producing nations of Islam. However, the birth and death rates are somewhat different in the two income groups. In the oil-producing nations, the crude death rate is very low (averaging 6 deaths per 1,000 population), while fertility remains quite high (average crude birth rate of 36 births per 1,000 population). In other Islamic nations, fertility and mortality are both higher, with crude birth rates averaging 43 per 1,000 and crude death rates averaging 15 per 1,000. Overall, then, having income levels commensurate with Western Europe has not yet been accompanied in the Islamic oil-producing nations by comparably low levels of fertility and natural increase.

Fertility in Islamic Nations

The single most remarkable demographic aspect of Islamic societies is the nearly universal high level of fertility—the average level of childbearing in Islamic nations is 6 children per woman. In the following paragraphs, we will explore the levels and trends in fertility, examine the factors that help to explain the continuing high levels of fertility (as well as the declines occurring in some Islamic nations), and then look at the relationship between the status of women and fertility in Islamic societies.

Levels and Trends

Fertility rates are highest for those Islamic nations in sub-Saharan Africa—an average of 6.6 births per woman (see Table 4). Furthermore, African Islamic nations south of the Sahara have higher fertility on average than do the other developing nations in that region. Yet the total fertility rate (TFR) of 5.9 for non-Islamic African nations is still higher than the 5.5 average for North African nations, all of which are Islamic. (The TFR is the average number of children a woman will have assuming she follows current age-specific birth rates throughout the childbearing years between 15 and 49). It seems a sub-Saharan location is associated with high fertility, even though being Islamic also plays a role. In Western Asia, the Islamic nations' average TFR of 6.2 is well above the average of only 2.8 for the two non-Islamic countries in the

Table 4. Total Fertility Rate of Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

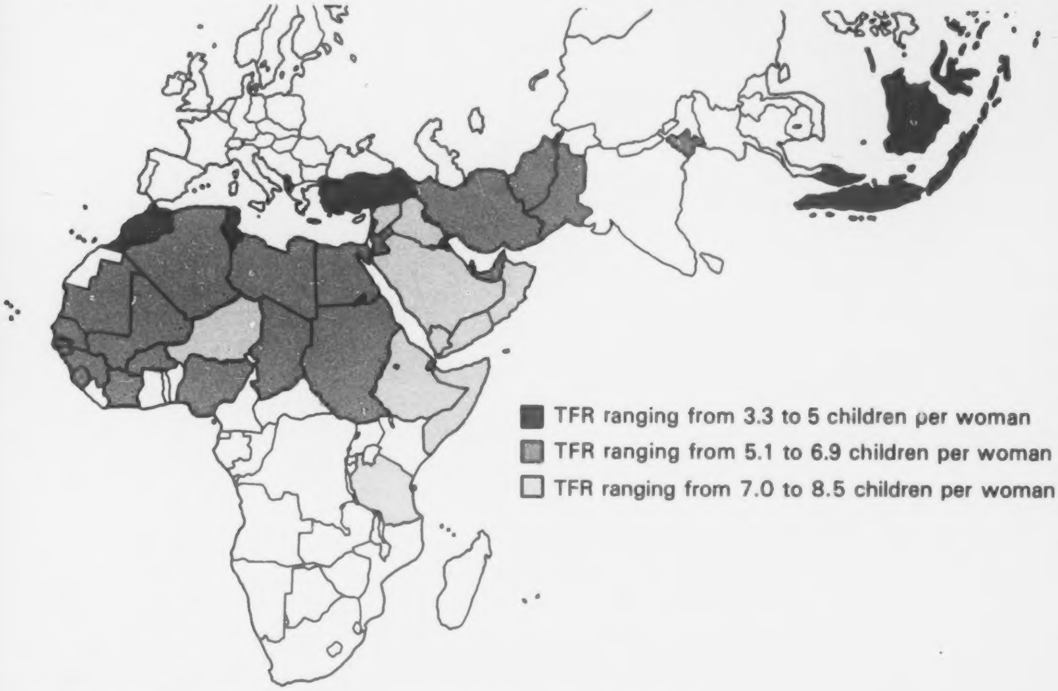
Geographic Region	Islamic Nations TFR	Islamic Nations (no.)	Other Developing Nations TFR	Other Developing Nations (no.)
North Africa	5.5	(6)	*	
Sub-Saharan Africa	6.6	(17)	5.9	(30)
Western Asia	6.2	(15)	2.8	(2)
South Asia	6.5	(4)	4.7	(4)
Southeast Asia	3.6	(3)	4.3	(8)
Europe	3.3	(1)	2.0	(6)**

* All North African nations are Islamic.

** Comparison is with countries with centrally-planned economies.

The Total Fertility Rate (TFR) is the average number of children a woman will have assuming she follows unchanged age-specific birth rates.

Figure 3. Total Fertility Rates in Islamic Nations, 1988


■ TFR ranging from 3.3 to 5 children per woman
▨ TFR ranging from 5.1 to 6.9 children per woman
☐ TFR ranging from 7.0 to 8.5 children per woman

Source: Population Reference Bureau, *1988 World Population Data Sheet*

region, Israel and Cyprus. In Southern Asia, it is also true that the Islamic nations exhibit higher average levels of fertility than do the non-Islamic nations. India has a numerically large Moslem population, but it represents only a small fraction of the total Indian population (an estimated 11 percent). Despite the widespread concern about high fertility in India, that nation's TFR of 4.3 is second lowest of the eight countries in that region—higher only than its close island neighbor Sri Lanka, where the total fertility rate in 1988 was 2.8.[9] Thus, in Western and Southern Asia, Islamic nations have clearly higher fertility than other countries in the region. Indeed, they appear to be more like one another than they are like the countries within their respective regions—a pattern somewhat different than that observed in sub-Saharan Africa.

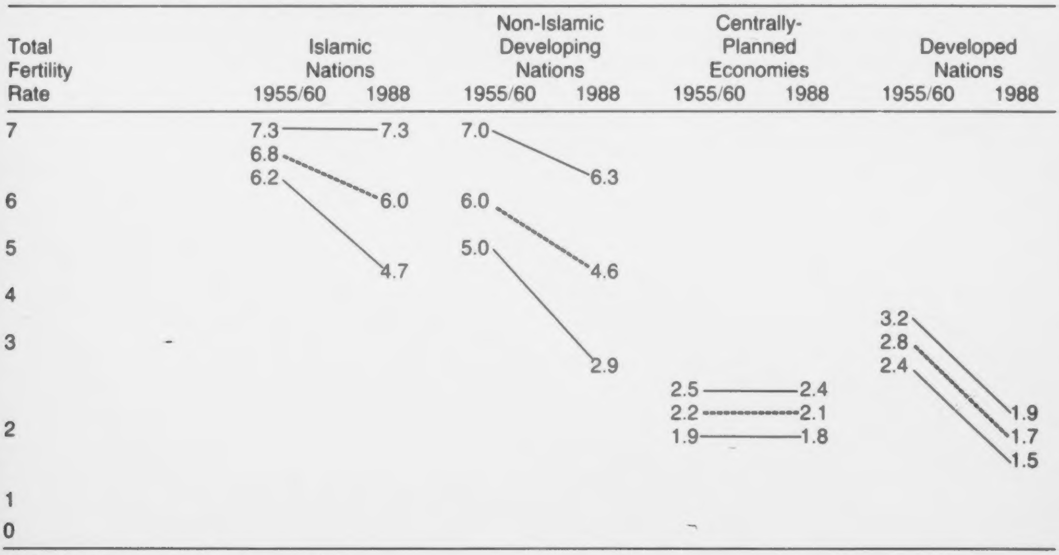
In Southeast Asia we find still another pattern. The three neighboring Islamic nations of Indonesia, Malaysia, and Brunei have fertility levels that are well below those of other Islamic nations in the world as well as being lower than most other developing nations in their region. Finally, the European Moslem-majority nation of Albania has a TFR of 3.3—exactly the same as Indonesia. However, though Indonesia's fertility is lower than its regional average, Albania's is the highest of any European nation and is well above the average for the surrounding countries with centrally-planned economies.

The variability in fertility levels is seen in Figure 4, showing the range in total fertility rates for two dates (1955/60 and 1988) for each of the major categories of countries that we have been using for comparative purposes. The range calculated is the mean (the arithmetic average) plus or minus one standard deviation unit away from the mean. This shows how widely scattered the countries within a grouping are around that category's average. For example, in the 1955/60 period the average TFR for Islamic nations was 6.8, and the Islamic nations clustered closely around that average. Within one standard deviation unit around the average were TFRs ranging from 6.2 to 7.3 lifetime births per woman. Thirty years later, in 1988, the average TFR in Islamic nations had dropped to 6.0, but the variability had increased, reflecting the fact that fertility was falling in some Islamic nations but not in others. During this period of time, fertility dropped substantially in the Islamic nations of Southeast Asia, as in other nations in that region. Fertility rates also declined noticeably in North African Islamic nations. There was some drop in Western Asia (about equally in Islamic and non-Islamic nations); there was a very small decline in fertility in Southern Asia among both Islamic and non-Islamic nations. Individually, three of the world's "top 20" fertility declines between 1955/60 and 1988 occurred in Islamic nations (Indonesia, Malaysia, and Tunisia), with two of those nations in Southeast Asia.

Figure 4 also shows that the other, non-Moslem developing countries experienced a steeper and more highly varied pattern of fertility decline than did Islamic nations. Countries with centrally-planned economies in Europe experienced almost no change in fertility during that 30-year interval, while the developed nations showed a marked decline and a lessening of variability in fertility levels among countries.

This noticeable regional and temporal diversity in fertility among Islamic nations reminds us that we make sweeping generalizations about the demography of Islam at our own peril. Nonetheless, having appropriately cautioned ourselves, an examination of the evidence concerning the reasons for the overall high levels of fertility in Islamic nations ensues.

Figure 4. Changes in Fertility Between 1955/60 and 1988 in Islamic and Non-Islamic Nations



Note: Center number is average TFR.

Sources: 1955/1960 from John A. Ross et al, *Family Planning and Child Survival: 100 Developing Countries* (New York: Columbia University, Center for Population and Family Health, 1988) Table 3; United Nations, *1964 Demographic Yearbook* (New York: United Nations, 1965); 1988 data from Population Reference Bureau, *1988 World Population Data Sheet*

Explanations of Fertility Levels

In order to understand high fertility anywhere in the world, it must be remembered that all nations that have survived to the present day did so by overcoming the historically high levels of mortality. Only within the relatively recent past have residents of the developed societies been able to take a long life for granted, and citizens of many developing societies (especially in sub-Saharan Africa, Western Asia, and Southern Asia) are still struggling to reach that point. Although we do not have good historical data for most of these countries, we do know that as recently as the beginning of this century, life expectancy at birth in India was no more than 20 years.[10] At this level, approximately 4 of every 10 babies born would die before reaching their first birthday, and 6 out of 10 would die before reaching adulthood.[11] Although death rates have improved substantially everywhere in the world, the social structures that support high fertility were developed over centuries of coping with the incredible riskiness of life. Those societies that did not match high mortality with high fertility did not make it into the modern world.

It is unlikely, of course, that a council of community elders sat around discussing ways to maintain high fertility. Rather, over time, many societies adapted to high mortality by encouraging youthful marriages and an early start to childbearing within marriage, and building in a variety of inducements to have children. As Kingsley Davis has noted, childbearing is rarely an end in itself.[12] Generally, it is sought as a means to some other end, such as expanding the ego, proving gender roles, continuing a family lineage and descent group, handing on property, securing economic welfare in old age, guaranteeing future family labor, or satisfying the believed demand of God. Underlying all of these reasons is perhaps the most important motivation of all—the desire for social approval. When a community believes that parenthood is important, it rewards parents with its most precious commodity—the approval of others. Equally important is the threat of rejection if we fail to meet society's expectations. To ensure that a sufficient number of children is born, virtually every human group has institutionalized pronatalist pressures—pressures to marry and procreate—which tend to be pervasive, subtle, and usually taken for granted, so much so that the decision to bear children is often misconstrued as "voluntary." Nothing could be further from reality.[13] We are socialized from birth to learn the rules of childbearing and believe that they are right, and this is reinforced by everyday life that puts us in contact with the norm-enforcement process, since other people have a keen interest in how we behave.[14]

This all adds up to the fact that high fertility is not so hard to understand if one recognizes that it represents the maintenance of a previously viable pattern of social behavior. Men and women for centuries have grown up expecting and wanting large families, and in many communities those expectations and desires persist because there have been insufficient changes in society to warrant a renegotiating of these behavior patterns. What is required for such a change? Ansley Coale has laid out what he calls the three preconditions for a substantial fertility decline. These include (1) the acceptance of calculated choice as a valid element in marital fertility; (2) the perception of advantages from reduced fertility; and (3) knowledge and mastery of effective techniques of fertility control.[15]

"Calculated choice" refers to a person's belief that they themselves have control over their bodies and over the number of children they have, rather than children coming along according to the "will of God" or according to some other Fate or Spirit beyond human intervention. Islam is frequently said to be opposed to the use of contraceptives be-

Pilgrims making the Haj *in Mecca, Saudi Arabia. The special garments worn by all eliminate differences and promote the communality of Islam.*

cause of the belief among its faithful that children are the "will of God," and that somehow the childbearing decision is thus out of human hands. However, this is a world view shared by many people of various religious backgrounds. Islam itself seems not to impose constraints on the use of contraception (although there are some objections to abortion and sterilization, as discussed below). "Summarizing Islamic opinion in 1971, Sheikh al-Sharabussy of Al-Azhar University [in Cairo] referred particularly to Ibn al-Qayyem and al-Ghazali and cited five situations in which contraception was acceptable to Islam."[16] These included: (1) the affliction of either of the (married) partners with a contagious disease which could be transmitted to the children with dire consequences of wretchedness and misery; (2) natural disposition on the part of the wife to have pregnancies in quick succession, which she is too weak to sustain; (3) concern for the health and life of the wife from too frequent pregnancies, if she is suffering from a malady that might be aggravated or caused by such pregnancies; (4) the husband's inability to meet the needs and demands of too many children; and (5) the safeguarding of a wife's beauty. The fourth situation—dealing with the economic burden of too many children—is probably most relevant to the modern world and is in keeping with Islam's general premise of trying to reduce hardship among its followers.

In general, then, Islamic scholars seem to agree that Islam itself prescribes no special barriers to the use of contraception; couples are granted the ability to exercise some control over reproduction.[17] Of course, that does not prevent rural peasants, urban villagers, or even clergymen themselves from raising objections to fertility control for a variety of reasons that may be labeled as "tradition" rather than "religion." In fact, uneducated women may believe that their bodies belong to their husbands, not to themselves, and that it is simply an unquestioned duty to bear the husband's children.[18] Peasants may be slow to yield on this issue, regardless of their ethnic background or religious preference; in European and American demographic history, secularization (aided especially by mass education) has been an important precursor of the attitude that individuals or couples can make their own decisions about family size.[19]

The world view of peasants as defined by George Foster in describing Mexican peasants can be analogously applied to Moslem peasants—they live under the mercy of nature and the supernatural as well as under the mercy of the urban elite, to whom they are often beholden.[20] Life is not under their control. It *is* dictated by forces beyond their direction, and as Laila El-Hamamsy has written in reference to rural Egyptians:

> It is not surprising that the Moslem peasant, living so precariously, should decide that fate, as determined by Allah, is responsible not only for the pleasures and good things of life, but also for its misfortunes and pain . . . Surely life would be insupportable were the peasant to

believe himself responsible, by his own deeds and efforts, for all that befalls him.[21]

History suggests that both social and economic development are required to lessen the threats that peasants (both rural and urban) perceive in their surroundings, allowing them to take control of their lives in ways that lead to decisions about family size. Typically such decisions lead to a limitation of fertility, regardless of religious background.

Even if people believe that reproduction is within their individual control, they may not be motivated to reduce their level of reproduction. For example, the Kenya Fertility Survey in 1977 (part of the World Fertility Survey) showed that among currently-married Moslem women in that country, the average desired family size was 8.4 children! This was the highest of any religious grouping, with Catholic women preferring an average of 7.1 children, and Protestant women an average of 7.0.[22] Clearly, women in Kenya wanted large families, regardless of whether or not they were Moslem. Two years earlier, the Sri Lankan Fertility Survey had revealed that currently-married Moslem women in that country expressed a desire for a family of 4.2 children. Buddhists preferred 3.9; Hindus preferred 3.8; and Christians expressed a desire for 3.4 children. Thus, although Moslem women preferred larger families than did members of other religious groups, it was also true that, regardless of religious preference, women in Sri Lanka wanted fewer children than did women in Kenya. Sri Lanka has experienced an earlier initiation into modernization than Kenya, including a fairly rapid decline in mortality, which accelerated the rate of population growth. Since the nation is an island, the negative consequences of rapid population growth show up perhaps more quickly than in a geographically more vast area such as East Africa. Sri Lankans have responded by lowering their expectations of fertility and the actual number of children they are having, while such a response has not yet occurred in Kenya. In Lebanon, Joseph Chamie found in 1971 that Moslems had higher fertility than Christians, but within each group there were observable differences. Catholics had higher fertility than non-Catholic Christians, while Shiite Moslems had higher fertility than Sunni Moslems.[23]

Only when people believe they can control their fertility and have a motivation to limit the number of children, will they seek the means to do so. In the meantime, of course, a variety of social mechanisms have kept fertility well below the biological maximum of about 15 live births per woman. Girls do not all become mothers as soon as it is biologically possible. Indeed, a few never marry at all, some have partners who cannot father children, and others will have their marriage disrupted by divorce or widowhood. Some women have difficulty conceiving or carrying a child to full-term, sometimes as a result of sexually-transmitted diseases. Children are typically spaced farther apart than would be biologically necessary (usually due to prolonged breastfeeding that delays the onset of ovulation). Even in the absence of modern contraceptives, ancient methods such as withdrawal reduce the risk of pregnancy, and abortions (either spontaneous or induced) have for centuries prevented some pregnancies from successful gestation.[24] Among all of these factors, John Bongaarts has shown that variations in fertility from one country to another can be largely accounted for by the following four factors he identified as proximate determinants: proportion married (especially at the younger ages), use of contraceptives, incidence of abortion, and involuntary infecundity (especially postpartum fecundity as affected by breastfeeding practices).[25]

Since virtually all women in nearly all developing societies marry, the important impact on fertility is derived from their age at marriage. Table 5 shows that, for those countries for which such data are available, an average of 34 percent of all brides in Islamic nations in recent years have been under 20 years of age. This is notably higher than the average of 23 percent for other developing countries, 27 percent for nations with centrally-planned economies, and only 12 percent in developed societies. As always, however, our interpretation of these findings has to take regional and ethnic diversity into account. Among North African Islamic nations, the average percentage of teen-aged brides was 43, compared with 39 percent in Western Asian Islamic nations and only 13 percent in Southeast Asian Islamic nations (no data were available for countries in sub-Saharan Africa).

Saad Gadalla has found that "early female age at marriage has been and still is a deeply rooted cultural norm in Egyptian villages, and it seems unlikely that this norm will change unless some strong social forces are introduced into the rural culture to make late marriages for women more desirable."[26] Any such forces would have to overcome two enduring features of life in peasant societies: (1) the feeling on the part of most villagers that marriage and childbearing are the most important functions in a woman's life, thus there is little benefit in keeping their daughters unmarried; and (2) the fear on the part of parents that their daughters might get involved in premarital sexual relations or become sexually promiscuous if they do not marry early. Once married, of course, there is immediate pressure to bear a child, in order especially to prove the wife's fecundity to her husband's family (and to herself). Youthful marriage is thus part and parcel of the traditional family system, reinforced by (but not necessarily caused by) Islam. Its underlying purpose is not only to enhance fertility, but it has that result.

We were also able to summarize data on the proportion of women aged 15-19 who are married, according to the most recent census or survey. The data in Table 5 show that in Islamic nations nearly twice the percentage of teen-aged girls is married compared to other developing nations. Furthermore, we can observe that in every regional comparison, nations of Islam have a higher percentage of girls aged 15-19 who are married than do the non-Islamic nations in the same region. These comparisons are summarized in Table 6 and Figure 5.

Regional differences can again be seen to be as important as religion in explaining fertility levels. Sub-Saharan African and Southern Asian nations tend to have high proportions of teen-aged

Table 5. Proximate Determinants of Fertility in Islamic and Non-Islamic Nations

Determinant of Fertility	Islamic Nations	Other Developing Nations	Centrally-Planned Economies	Developed Nations
Percent of brides who are under age 20	34	23	27	12
Percent of women 15-19 who are married	35	19	10	3
Percent of married women using some method of contraception	22	39	69	70
Percent of women who were still breastfeeding their last baby at age 12 months	60	57	—	—

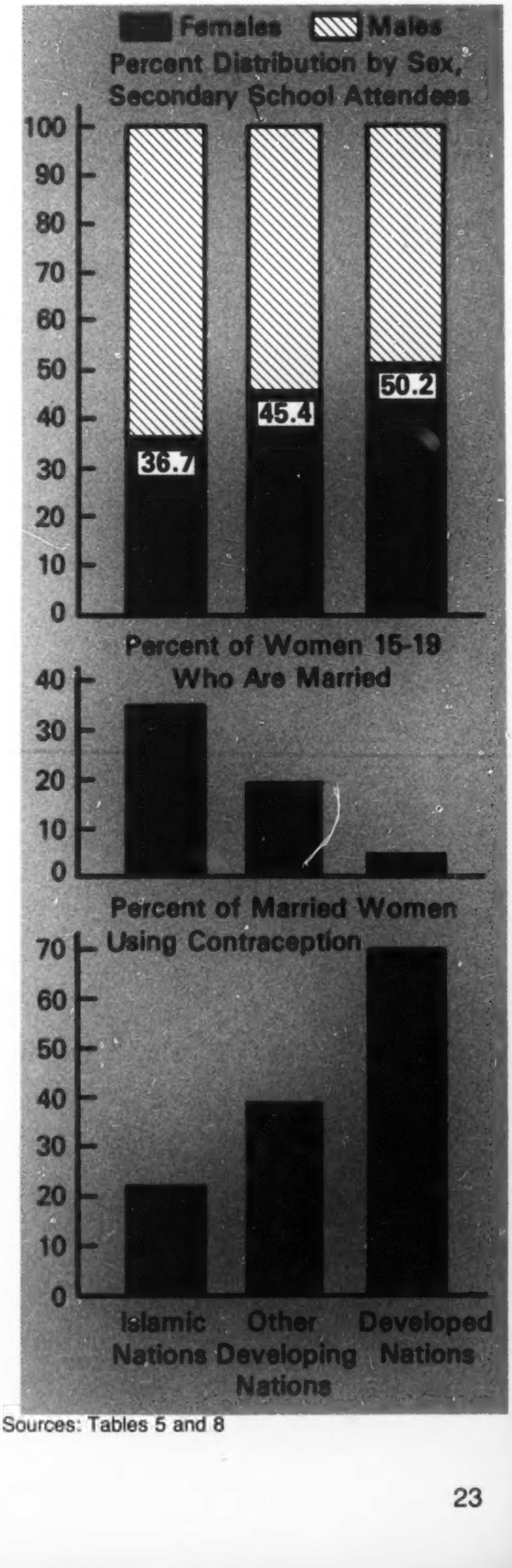
Sources: United Nations, *1982, 1984, 1986, 1988 Demographic Yearbook* (New York: United Nations); John A. Ross et al, *Family Planning and Child Survival: 100 Developing Countries* (New York: Columbia University, Center for Population and Family Health, 1988) rearing, and their motivation to limit family size may not be as strong as that of a woman.

Currently-married women in Islamic nations are only half as likely as currently-married women in other developing nations to be using some form of contraception, as shown in Tables 5 and 6, and Figure 5. Furthermore, in all three regions (sub-Saharan Africa, Southern Asia, and Southeast Asia) in which there are both Islamic and non-Islamic nations, the percentage of currently-married women who are contraceptors in Islamic nations is lower than the percentage in non-Islamic nations (see Table 6). Again, note the considerable regional diversity in contraceptive use for both Islamic and non-Islamic nations.

An analysis was undertaken to see if it was possible to determine statistically whether being an Islamic nation was more important than being in a particular geographic region in terms of explaining the differences between countries in the percentage of women using contraception, restricting our analysis to developing nations. Our results showed that the most important factor explaining the between-country differences in contraceptive use was a geographic one; specifically, whether the country was in sub-Saharan Africa (regardless of whether the nation was Islamic).[32]

Sub-Saharan nations have a far lower percentage of currently–married women using contraceptives than do developing nations elsewhere in the world, and this pattern holds for Islamic and non-Islamic nations alike. However, outside sub-Saharan Africa, being an Islamic nation is a more important factor than geographic region in explaining the different percentages of contraceptors from one country to another. Identical results were found in an assessment of whether being an Islamic nation or being in a geographic region was more important in explaining country-to-country differences in the percentage of teen-aged women who are married. Being a sub-Saharan African nation was also more important than

Figure 5. The Status of Women



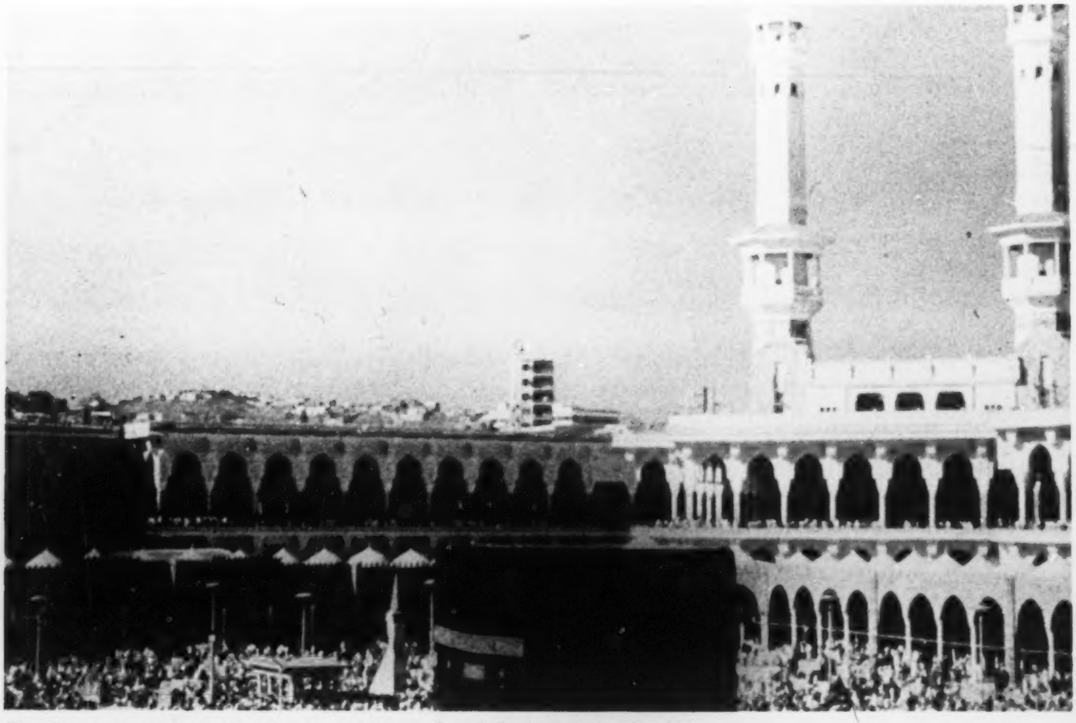
Sources: Tables 5 and 8

being an Islamic nation, but outside sub-Saharan Africa, being an Islamic nation is more important than being in one of the other geographic regions.

Data on abortions are very scarce for developing nations, but those that have been published suggest that, excluding China, the abortion ratio (the number of abortions per 100 known pregnancies—defined as abortions plus births that occurred six months later) in developing societies of Asia and Africa are well below the rates in Europe and the United States. It is reported that in 1983 the abortion ratio in the United States was 30 abortions per 100 pregnancies, while it was 68 in the USSR in 1982 and 43 in China in 1983.[33] By contrast, the ratio in Bangladesh in 1984-85 was reported to be only 1.5 abortions per 100 pregnancies, while the figure for India in 1983-84 was 2.1, and for Tunisia in 1985 it was 9 per 100.

There is concern, however, in many developing nations, including Islamic nations, that clandestine abortions are fairly frequent and may be an explanation for high maternal mortality rates (discussed below).[34] In general, Islamic nations permit abortion for medical reasons, although two Islamic nations (Tunisia and Turkey) permit abortion on request, whereas there are four Islamic nations (Burkina Faso, Côte d'Ivoire, Mauritania, and Niger) in which abortions are illegal and there are no exceptions.[35] A shortage of adequate medical facilities and trained personnel almost certainly limits a woman's access to a safe abortion even in those countries where it is permitted.

Finally, with respect to Bongaarts' fourth proximate determinant of fertility, breastfeeding, Table 5 shows that there is little difference between Islamic and non-Islamic developing nations in the percentage of women who were still breastfeeding their most recent baby when the child was 12 months old. This lack of difference between Islamic and



The Great Mosque and the Kaaba in Mecca, Saudi Arabia, during the Haj.

non-Islamic nations was observed across all geographic regions, but there were also some important regional differences in breastfeeding patterns. In particular, African and Southern Asian women were more likely to prolong breastfeeding (with an average of 73 percent of women still breastfeeding their child at 12 months); Western Asian women were least likely to do so (an average of 26 percent of women still breastfeeding at 12 months), with women in Southeast Asian nations falling in between those two extremes (55 percent).[36]

Having evaluated the motives leading to fertility control and the means whereby those motives may be implemented, we conducted a statistical analysis to assess how well a nation's status as Islamic or non-Islamic could predict that nation's total fertility rate, taking into account the proximate determinants of fertility, including contraceptive use and youthful marriages, and controlling for geographic region. Our analysis revealed that contraceptive use is by far the most important of these variables in explaining between-country differences in fertility levels. After controlling for contraceptive use, the proportion of young women who are married, and geographic region, there was nothing else unique about Islamic nations that could explain the differences in fertility.

The Status of Women

There is widespread agreement among Western demographers that the status of women can be an important determinant of fertility levels.[37] One definition of the status of women is Ruth Dixon's, based on the degree of women's access to and control over material and social resources within the family, community, and society in general.[38] Worldwide data show that high fertility persists in areas where the status of women is low, and low fertility persists in areas where the status of women is high. Revisions of the theory of the demographic transition have taken into account the fact that the rising status of women can generally be an effective spur to economic development and growth, partly by generating motivations for smaller families. Women tend to gain status by engaging in activities formerly reserved for men—especially obtaining an education, engaging in non-agricultural labor force activities, and becoming involved in social and political organizations. These activities generally compete with childbearing and childrearing, and the motivation to limit family size becomes well entrenched, even though pronatalist pressures continue everywhere to encourage having children. History records emphatically that when people are sufficiently motivated to limit family size, they find the means to do so, although it is obviously far easier when efficient modern methods of fertility control are available.[39]

An improvement in the status of women does not depend upon economic development—although that often helps, nor is it typically an individual option in the absence of a broad-based social consensus. It usually comes about as a result of a concerted collective effort within a community. This appears to have happened in Tunisia, as an example. After gaining independence from France in 1956, a personal status code was enacted in the areas of marriage, divorce, and children's rights and women were permitted to vote.[40] These changes were promoted personally by President Habib Bourguiba, who actively championed the advancement of women. Insight into the mechanisms of social change in Tunisia can be gained from the following comment made in the late 1970s by the wife of a village leader:

> 'Tell me what differences you see between your life and those of your daughters.'
>
> 'There's a big difference between my life and theirs. I couldn't even go to town in my day. Now my daughters go about here and there. We didn't get to meet our husbands until we were married. They just gave us a husband we didn't know. Of course I have learned things also during these new times.

> I kept hearing things around me so I began to learn hygiene, how to better care for my children, how to give them an education different from my own. We all began to imitate each other, and that is how we changed our old habits. Nowadays it is much better, better at all levels.'
>
> 'What brought about these changes?'
>
> 'It was Bourguiba. Where else do you think it come from? Now, women are free. They can go where they want. Men can't say anything. They can't keep women from doing what they want. Women are free, and women are just as capable as men. They are equal.'[41]

An ambitious, government-sponsored family planning program has made modern contraceptives and sterilization and abortion procedures available to a large segment of the Tunisian population.[42] In response, the total fertility rate has dropped from 7 births per woman in the 1960s to 4.4 births per woman by 1988. Among Middle Eastern Islamic nations, only Lebanon now has a lower rate of fertility. It is certainly not a coincidence that data from the World Fertility Survey show that the highest age at marriage among Middle Eastern Islamic nations was in Tunisia (24 years), while the youngest age at marriage was found in the Yemen Arab Republic (17) which has the region's highest fertility level (a TFR of 8.2 in 1988).[43]

Islam itself does not impose any particular restrictions on labor force activity by women (the Prophet Mohammed's wife was a successful trader), but tradition has tended to impose itself in many Islamic nations. In virtually every Islamic nation there are growing numbers of women who are well-educated and/or are engaged in non-domestic, non-agricultural labor force activities. Depending upon the force of tradition in the specific country, such women may or may not represent the cutting edge of a rise in the status of women. In some Islamic nations, opportunities for women within the framework of a generally gender-segregated society have included the establishment of gender-segregated universities and gender-segregated occupational structures (training women to serve the female population—as teachers or physicians, for example).

On a regional basis it is difficult to find enough data measuring the status of women for enough countries to make worthwhile comparisons. One important element is the ratio of girls to boys enrolled in secondary schools. Although we do not have good data for most developing societies on completed levels of education, the current school enrollment patterns should be very suggestive about future educational outcomes. Table 7 points up the fact that in Islamic nations there are only 58 girls for every 100 boys enrolled in secondary education. In non-Islamic developing nations, girls are less disadvantaged, with a ratio of 83 girls per 100 boys. Developed nations have virtual equality with a ratio of 101 girls per 100 boys, and males are actually at a disad-

Table 7. Indicators of the Status of Women in Islamic and Non-Islamic Nations

	Islamic Nations	Non-Islamic Developing Nations	Centrally-Planned Economies	Developed Nations
Ratio of girls per 100 boys enrolled in secondary schools	58	83	184	101
Ratio of female life expectancy at birth to male life expectancy at birth	106	107	111	108

Sources: United Nations, *Demographic Yearbook*, various years; John A. Ross et al, *Family Planning and Child Survival: 100 Developing Countries* (New York: Columbia University, Center for Population and Family Health, 1988)

Table 8. Indicators of the Status of Women in Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

Geographic Region and Indicator	Islamic Nations ratio	(no.)	Other Developing Nations ratio	(no.)
Ratio of girls per 100 boys enrolled in secondary schools				
North Africa	72	(4)	*	
Sub-Saharan Africa	45	(11)	63	(19)
Western Asia	65	(11)	126	(1)
South Asia	36	(2)	56	(4)
Southeast Asia	86	(2)	91	(4)
Ratio of female life expectancy at birth to male life expectancy at birth (x 100)				
North Africa	106	(6)	*	
Sub-Saharan Africa	106	(13)	107	(23)
Western Asia	105	(11)	105	(1)
South Asia	98	(2)	99	(4)
Southeast Asia	105	(2)	106	(6)

* All North African countries are Islamic.

Sources: United Nations, *Demographic Yearbook*, various years; John A. Ross et al, *Family Planning and Child Survival: 100 Developing Countries* (New York: Columbia University, Center for Population and Family Health, 1988)

vantage educationally in countries with centrally-planned economies.

Table 8 shows that women in Islamic nations are at a disadvantage with respect to school enrollment in comparison with other developing nations in each different geographic region. But, again, we find that regional differences are more pronounced than the within-region difference between Islamic and non-Islamic nations. For example, using secondary school enrollment as an index to the status of women, it is clear that women are faced with the lowest status in Southern Asia (comprising essentially the entire Indian sub-continent) regardless of whether they live in a predominantly Islamic or predominantly non-Islamic society. At the other extreme among developing nations, female secondary education is at its highest in Southeast Asia, regardless of whether the women live in an Islamic nation.

A more subtle indicator of the status of women is the comparison of their life expectancy with that of men in the same nation. In most human societies, more male babies are conceived than females and, although fetal mortality is higher for males than females, there are usually about 105 male births for each 100 female babies born alive. Given equal access to food, shelter, clothing, and health care, women will experience lower risks of death than men at every age. The evidence is strong enough to suggest a type of biological advantage to women, perhaps related to the hormonal system. Thus, when and where we find that females are at greater risk of dying than men, or that the difference is minimal, the inference is that women are not being provided equal access to the community's resources. This probably reflects differential infant mortality among female babies who may not be as highly prized and thus not as carefully nursed in infancy. This is an indirect index, then, of the status of women in society.

As shown in Table 7, the differences in the ratio of female to male life expectancy are not large from one group to another, although the ratio is lowest in Islamic nations. Regional comparisons of mortality ratios show that women in Islamic nations are, on average, at a disadvantage compared to women in non-Islamic countries in the same region, but women are at the greatest disadvantage in Southern Asian nations, regardless of whether the nation is Islamic. This is the same conclusion we drew when examining school enrollment as an index of status.

Using the types of data that we have just discussed, in addition to other related variables dealing with health, education, fertility, and labor force activity, the Population Crisis Committee in "Poor, Powerless, and Pregnant" has constructed an index of the status of women for 99 countries of the world, including 23 of the Islamic nations.[44] Each country was given a score between 1 and 5 on 20 different indicators of the status of women, with number 5 equaling the highest status for women. The figures were then added to produce an overall index between 20 (lowest status) and 100 (highest status). The highest score (87) was found for Sweden and, in fact, 19 of the top-scoring 20 countries were developed nations or European countries with centrally-planned economies; the single exception was Jamaica. The lowest-ranked country was Bangladesh (with a score of 21.5), and 16 of the lowest-scoring 20 were Islamic nations. Even within the same region, Islamic nations received lower scores than non-Islamic nations (see Table 9). In general, however, the data confirm our previous assessment that women are least advantaged in sub-Saharan Africa and Southern Asia, regardless of religious affiliation.

The relatively low status of women in Islamic nations is not a static situation. In recent years fertility has dropped in Jordan and Kuwait almost entirely as a result of a delay in marriage.[45] Delaying marriage may permit a young woman to develop alternatives in her life to a large family, and it may reduce the difference in age between her and her husband, thus leading to a greater chance that communication might occur over the issue of family size and fertility control. Another small sign of change was noticed in a survey of Palestinian refugees on the West Bank of the Jordan River. Although only 50 percent of young wives in the survey had ever talked to their husbands prior to marriage, that was higher than the 30 percent recorded for

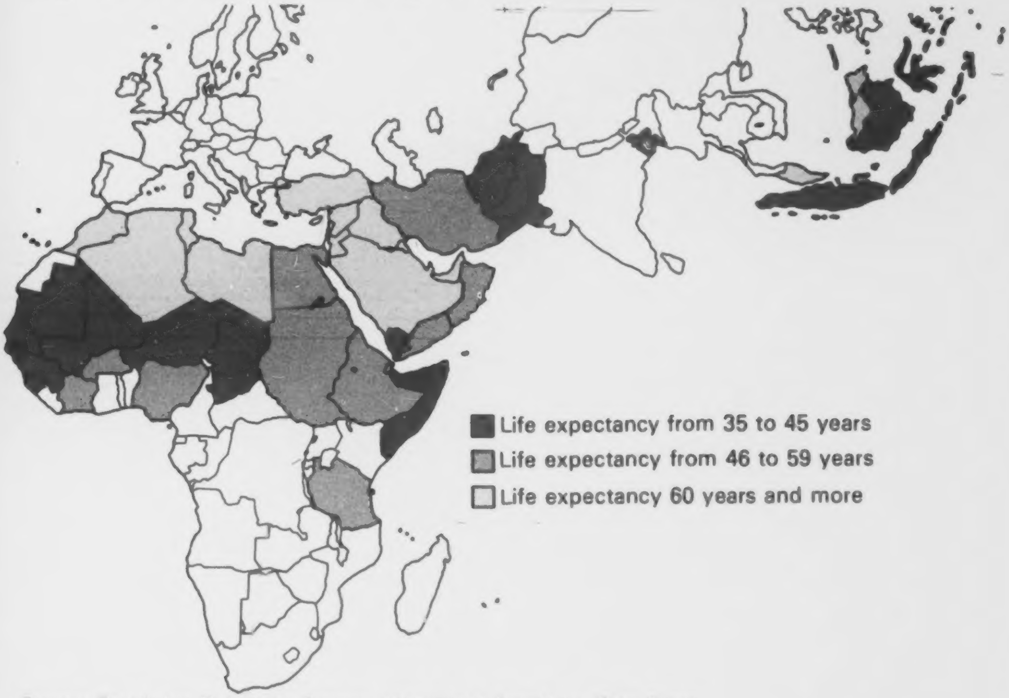
Table 9. Status of Women Scores in Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

Geographic Region	Islamic Nations score	(no.)	Other Developing Nations score	(no.)
North Africa	40	(6)	*	
Sub-Saharan Africa	32	(4)	43	(12)
Western Asia	42	(8)	71	(1)
South Asia	25	(3)	47	(3)
Southeast Asia	52	(2)	63	(3)

* All North African nations are Islamic.

Source: Population Crisis Committee, 1988

Figure 6. Life Expectancy at Birth in Islamic Nations, 1988


■ Life expectancy from 35 to 45 years
▨ Life expectancy from 46 to 59 years
☐ Life expectancy 60 years and more

Source: Population Reference Bureau, *1988 World Population Data Sheet*

older wives in the survey. Furthermore, younger wives were much more likely to have completed secondary school than older wives, and the younger women were nearly as likely as their husbands to have completed secondary school.[46]

Whether the impetus comes from a change in the status of women or from some other source, fertility throughout the Islamic world is not declining in parallel with the improvements in mortality that have been occurring.

Mortality in Islamic Nations

Islamic nations as a group have the world's highest levels of mortality; however, death rates all over the world have been dropping fairly steeply since the end of World War *II*. The two "deadliest" areas of the world—the western coast of Africa just south of the Sahara, and the Horn of Africa with the southern part of the Arabian peninsula—are predominantly Islamic regions. On the western coast of Africa the Islamic nations of Gambia, Guinea, Guinea-Bissau, Senegal, and Sierra Leone have a combined (unweighted) average life expectancy in 1988 of only 40 years. Directly east on the Horn of Africa, the Islamic nations of Djibouti, Somalia, the Yemen Arab Republic, as well as Ethiopia, have a combined average life expectancy in 1988 of 46 years. As harsh as those numbers are, compared with more than 75 years in Japan and many Western European countries, they represent a substantial improvement in the years since most of these nations have gained independence from Europe. In 1960, when life expectancy in the United States hovered at 70, it was only 34 in West Africa and 36 in the countries of the Horn of Africa. Throughout the developing world, the epidemiological transition has been occurring as improved standards of living conditions have reduced deaths from communicable diseases.[47] As always, infant mortality rates fall the fastest during the onset of mortality decline. In the Islamic nations on the western coast of Africa, the infant mortality rate declined from an average of 212 per 1,000 live births in 1960 to 153 currently. This means that in 1988, 59 more children out of every 1,000 born that year were surviving to their first birthday than had survived 28 years before in 1960. From the standpoint of the community, it was equivalent to the birth rate having increased by that amount. To the east, the Islamic nations on the Horn of Africa and in the southern Arabian peninsula witnessed a drop in the infant mortality rate from 199 per 1,000 births in 1960 to 153 in 1988—a nearly identical increase of 56 more babies per 1,000 surviving to age one in recent times.

There can be no question, however, that the high death rates in these equatorial Islamic nations have little, if anything, to do with Islam. The reasons are found in poverty and underdevelopment, with the lack of sufficient resources to improve the health profile and living conditions any faster than is already being done. One way to assess this is to compare mortality indices in Islamic and non-Islamic nations according to per person income levels. The median (the mid-point of the distribution; not the arithmetical average) per person income among non-oil-producing Islamic nations is approximately $500, used as a somewhat arbitrary dividing point for a comparison of mortality indicators. Life expectancy in those Islamic nations with average per capita incomes under $500 is only 47 years, compared with 62 in the nations with a per person income of $500 or more per year (see Table 10). This is the same pattern found in non-Islamic developing nations.

Infant mortality rates as well as maternal mortality rates (pregnancy and childbirth-related deaths) are also highly sensitive to national income levels, as Table 10 shows. Among Islamic nations, the infant mortality rate is 138 per 1,000 births for the lower-income nations, and 74 for the higher-income nations, while maternal mortality rates average 642 per 100,000 live births for the lower-income Islamic nations and 442 for the higher-income Islamic nations.

Death and disease have few religious

Table 10. Mortality Indicators by Income Level for Islamic and Non-Islamic Nations

Mortality Indicator and Income Level	Islamic Nations	(no.)	Non-Islamic Developing Nations	(no.)
Life expectancy at birth				
average per person income:				
less than $500/year	47	(17)	53	(23)
$500 or more/year	62	(19)	66	(51)
Infant mortality rates/1,000 births				
average per person income:				
less than $500/year	138	(17)	102	(23)
$500 or more/year	74	(19)	48	(51)
Maternal mortality rates/100,000 births				
average per person income:				
less than $500/year	642	(11)	500	(18)
$500 or more/year	442	(11)	173	(32)

Sources: United Nations, *Demographic Yearbook*, various years; John A. Ross et al, *Family Planning and Child Survival: 100 Developing Countries* (New York: Columbia University, Center for Population and Family Health, 1988)

Table 11. Life Expectancy in Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

Geographic Region	Islamic Nations years	(no.)	Other Developing Nations years	(no.)
North Africa	60	(6)	*	
Sub-Saharan Africa	45	(17)	53	(30)
Western Asia	62	(15)	75	(2)
South Asia	51	(4)	56	(4)
Southeast Asia	65	(3)	58	(8)

* All North African countries are Islamic.

Source: Population Reference Bureau, *1988 World Population Data Sheet*

determinants, of course. In general, death rates remain higher than the world average throughout the developing world because of the continuing high prevalence of infectious and parasitic diseases and the high prevalence of malnutrition (especially among infants and children). These causes of death are compounded by unclean water supplies, unsanitary waste disposal, poor housing, living in the midst of disease-transmitting insects and rodents, and inadequate personal and food hygiene.[48] A generally unhealthy environment is matched by the inadequate supply of trained people, services and institutions to meet the virtually overwhelming need for medical assistance—especially health care for mothers and children.

Morbidity and mortality levels vary by region, somewhat independently of income levels, since some geographic zones are by nature less hazardous to health than others. In Table 11 you can see that, outside of Europe, the highest life expectancies in Islamic nations are found in Southeast Asia, followed in order by Western Asia, North Africa, South Asia, and sub-Saharan Africa. The same pattern prevails for infant mortality rates and maternal mortality rates.

Maternal mortality has recently come under renewed scrutiny as researchers gradually became aware that the successful diminution of this cause of death in developed nations has not been accompanied by a parallel decline in developing societies. Part of the explanation lies in the prevailing high levels of fertility and part lies in the access that a woman has to health care services during pregnancy. Even in developed societies, the risk of death associated with a pregnancy is greater than the risk of death associated with contraceptive use.[49] The fact that women in developing societies put themselves at risk more often with more pregnancies helps to explain the higher death rate associated with pregnancy and childbirth. In a comparative study of maternal mortality in Egypt and Indonesia, Judith Fortney and her associates found that the profile of causes of death in the two countries was quite similar, with complications of pregnancy leading the list in both nations.[50] However, in Indonesia, where fertility has been declining, it appears that using contraception and limiting the number of pregnancies was a major factor in explaining differentials in maternal mortality; whereas in Egypt fertility has remained high, but there is greater access to maternity hospitals where adequate care can be obtained. Societies which have been able to combine lower fertility with good maternal care thus have the lowest levels of maternal mortality. For example, the researchers calculated that, relative to population size, the maternal mortality rate in Egypt is 48 times that in the United States, and in Indonesia it is 77 times as high.

In discussing the status of women, we referred to the fact that in a few countries males still have a higher life expectancy than females. In the last decade, there were six countries in which this was true—Bangladesh, Bhutan, India, Iran, the Maldives, and Nepal.[51] Half are Islamic; half are not. More important is the fact that they are all either in Southern Asia or (in the case of Iran) contiguous to it. Sri Lanka, also in Southern Asia, had followed this pattern until recently and demographers Eduardo Arriaga and Peter Way of the U.S. Bureau of the Census have concluded that the higher female mortality in Sri Lanka was due to causes of death associated primarily with nutritional deficiencies.[52] These factors are related more to the status of women than they are to other prevailing diseases. The data also suggested that maternal mortality, per se, did not contribute significantly to the gender gap in mortality in Sri Lanka.

Today, more than one-third (36 percent) of the nations of the world have attained a life expectancy at birth of 70 years or more. This includes all of the developed nations, virtually all of the centrally-planned economies of Eastern Europe, and 30 percent of the non-Islamic developing nations. However, only three Islamic nations have achieved that level—Albania (in Europe), Brunei (in Southeast Asia), and Kuwait (in Western Asia). It is obvious, then, that there is still room for dramatic improvement in health levels and life expectancy throughout the Islamic world. As these improvements occur (as they almost certainly will), the population pressure will increase in these nations, pushing some people to migrate in search of other opportunities.

Migration in Islamic Nations

Migration has been a fairly common aspect of Islamic life for centuries. The Islamic calendar begins on the date that the Prophet migrated from Mecca to Al-Medina. The Haj itself represents a significant journey, even with the advent of modern transportation, and although it cannot be defined as migration itself, the pilgrimage has almost certainly influenced migration over the years by introducing Moslems to new lands and new opportunities.[53] Over the decades, of course, the political boundaries of virtually all of the Islamic nations of the world have changed so often that what in this year might be internal migration would have been international migration 50 years ago, and vice versa. Lebanon's current civil war traces its roots back to centuries of in- and out-migration of members of different religious groups, including Sunni Moslems, Shiite Moslems, Druze (a group that originated in Islam), Maronite Christians, and Greek Orthodox Christians.

In recent decades there have been three important aspects of migration in Islamic nations that we will examine briefly in this section: (1) guest-worker international migration; (2) urbanization; and (3) refugees in Islamic nations.

Guest-worker International Migration

The end of World War II found European nations trying to rebuild economically in the midst of a labor shortage caused by low birth rates during the Depression years and high male mortality during the war. They turned for labor to their colonies or former colonies. In many instances, granting independence to colonies itself produced an outflow of migrants from those colonies to Europe—Pakistanis to the United Kingdom, Algerians to France, Indonesians to the Netherlands. Others were later recruited to go to Europe as temporary "guest-workers," but have stayed as permanent residents. Migration from developing nations to Europe and the United States has typically involved a disproportionate number of well-educated professionals, contributing to the much-publicized "brain drain," which in some cases has further complicated the process of economic development in the sending nations. In Northern Africa the stagnating economies have combined with high rates of population growth to produce rampant underemployment, especially among younger men trying to enter the labor force. The age structure of Europe, of course, is the mirror image of Northern Africa—there is a vacuum of those at the usual age for labor force entry in Europe which the youthful population of Northern Africa can easily fill. As a result, the fairly easy trip across the Mediterranean to Europe (usually to the former colonial power) is being made by an increasing number of migrants: legal and illegal. It is a situation that has been likened to the migration stream between Mexico and the United States.[54]

One of the largest guest-worker programs between a European and an Islamic nation is that between the Federal Republic of Germany (West Germany) and Turkey. Although Turkey had remained neutral in World War II, it had sided with the Germans in World War I and the ties between the two countries continued. Between 1950 and 1974, more than 1 million guest-workers migrated from Turkey to West Germany, and by the mid-1980s there were an estimated 1.5 million people of Turkish origin residing in that country.[55]

Equally significant are the guest-worker programs between nations of Islam. As of 1980, there were approximately 3 million guest-workers throughout the Middle East, working primarily in the oil-producing nations: Saudi Arabia (with 1 million workers), Libya (500,000), the United Arab Emirates (400,00), Kuwait (400,000), Iraq (100,000) and Qatar, Bahrain, Jordan, Oman, and Yemen (less than 100,000 each).[56] The principal sending countries have included Egypt (700,000), Pakistan (400,000), Yemen (300,000), Jordan, including the West Bank (250,000), and Iran (100,000).[57]

In general, guest-worker programs have been demographically and economically beneficial to both sending and receiving nations. The sending nations have been able to use the labor migration to siphon off a certain amount of population pressure, while gaining economically from the remittances sent home by the workers. The host countries benefit by receiving labor that, through normal migration selectivity, tends to be the cream of the crop without having had to invest in the rearing and education of the labor force. To be sure, the rapid economic development of the Gulf region would have been impossible without the massive in–migration of labor, and it is likely that foreign labor will be required for the foreseeable future.[58]

As a result of their country's need for outside sources of labor, native Kuwaitis now form a minority (43 percent) population within their own nation and this fact has led to a concern in that and other Gulf nations about the extent to which guest-workers may wind up being "settlers" rather than "sojourners." Most of these countries impose substantial barriers to citizenship for non-natives, but there is nonetheless some evidence of a rise in the number of expatriate men who are sending for their families and who are applying for naturalization in the oil-producing nations.[59] The alarm with which such events have been noted in the labor-receiving countries of the Arab Gulf is reminiscent of that which has been observed in the European reaction to the permanent settlement of guest-workers.

Urbanization

While some people from the nations of Islam have been migrating to other nations in search of opportunity, the search for a better life has more often focused on the larger cities of the developing countries themselves. High rates of population growth in rural areas, compounded by stagnating rural economies, have pushed many residents out of agrarian areas toward those areas where "development" is occurring—the cities.

In 1970 not a single city in an Islamic nation was within the largest 20 cities of the world in terms of population size. By 1985, Cairo, Egypt (with approximately 8 million people), Jakarta, Indonesia (approximately 8 million), and Teheran, Iran (7.5 million) were on that list. United Nations projections suggest that by the year 2000, 5 of the "top 20" will be Islamic cities—Cairo (with 11 million), Jakarta (13 million), Teheran (nearly 14 million), Karachi, Pakistan (12 million), and Dacca, Bangladesh (11 million).[60] This amazing growth of cities is occurring despite the fact that, as a group, Islamic nations remain the least urbanized of all the world's nations.

The national average percentage of the population living in urban places in 1988 was 48 worldwide, whereas Islamic nations averaged only 40 percent. Table 12 shows, however, that this average is brought down by the low urban fractions in sub-Saharan Africa, Southern Asia, and Southeast Asia. Northern African Islamic nations' percentages are right at the world average, while Western Asian Islamic nations are well above that average.

People are drawn to the city by the prospect of higher wages than in the countryside, the lure of education for their children, and the proximity to the source of whatever medical, social, and economic development may be occurring in the nation. This has been especially true in the capital cities of nations that have recently gained independence.[61]

Table 12. Percent of the Population Living in Urban Places, Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

Geographic Region	Islamic Nations percent	(no.)	Other Developing Nations percent	(no.)
North Africa	47	(6)	*	
Sub-Saharan Africa	28	(17)	32	(30)
Western Asia	59	(14)	76	(2)
South Asia	21	(4)	15	(4)
Southeast Asia	40	(3)	30	(8)

* All North African countries are Islamic.

Source: Population Reference Bureau, *1988 World Population Data Sheet*

It is too often the case, however, that the infrastructure of the city is no better able to cope with the growing population of new migrants than the infrastructure of the countryside. Thus we find in Cairo that an estimated 23 percent of the city's population is composed of slum-dwellers and squatters.[62] In Baghdad, Iraq, the figure is 29 percent; in Dacca, the capital of Bangladesh, the percentage is 35; and in Jakarta, the capital of Indonesia, it is 26 percent. These people join millions of others living like refugees within their own nation.

Refugees in Islamic Nations

Refugees in Islamic nations come primarily from three sources: (1) tribal/ethnic conflict in sub-Saharan Africa; (2) the violence in Afghanistan between Afghan rebels and the Soviet forces occupying the country through 1988; and (3) the Palestinian refugees.

To be classified as a refugee by the United Nations, according to the Geneva Convention, a person must leave their country of origin in fear for their life, usually because of persecution due to race, religion, ethnicity, and/or political beliefs. War, drought, and famine are other reasons to leave one's country. In sub-Saharan Africa, the colonial politics of nation-building often created political boundaries that transgressed traditional ethnic demarcations, throwing historically competitive groups into the same country, while separating groups of similar ethnic background. Regardless of the reasons for so drawing maps, the demographic impact of the resulting series of conflicts has been to produce a population of more than 3 million refugees in sub-Saharan Africa. The list is headed by more than 1 million from Ethiopia, who have fled primarily to Somalia and the Sudan to escape intertribal violence, aggravated by recent drought and famines.[63]

The conflict in Afghanistan has produced an estimated 5 million refugees from that country, with some 2 million estimated to be in Iran and 3 million in Pakistan. It is still too early to know if the promised withdrawal of soldiers from the Soviet Union will result in a repatriation of a significant number of Afghan refugees.

Another demographically and politically explosive refugee group are the Palestinians. As of 1987, there were an estimated 2.2 million Palestinian refugees, spread out principally among several Islamic nations, including Jordan (852,746), Gaza (447,850), West Bank (375,835), Lebanon (287,420), and Syria (259,854). Egypt, Kuwait, Iraq, and Libya also have smaller numbers of Palestinian refugees.[64] The number of refugees is only part of the demographic equation, of course, especially from the perspective of the receiving country. The other half of the equation is the size of the host country. In Jordan, for example, 1 out of every 5 people is a refugee; in Lebanon, 1 in 10, and in Somalia, 1 in 15. In the world as a whole, 10 of the 15 countries with the highest ratio of refugees to population are Islamic nations, underscoring the fact that two-thirds of the world's 13 million refugees reside in Islamic nations.

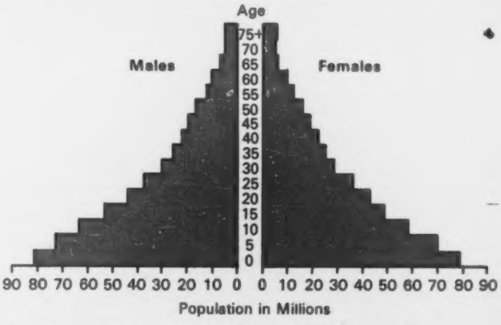
Worldwide, refugee settlements, like squatter settlements, tend to have fairly high death rates, but even higher birth rates, leading to a rapid rate of population growth, exacerbated by a young population with its own built-in momentum for additional growth.

Age and Sex Composition of Islamic Societies

One of the consequences of high fertility in any society is a very young age structure, characterized by a high proportion of people concentrated in the youngest age groups. Because Islamic nations tend to have higher-than-average fertility levels, they therefore also have younger-than-average populations. Islamic nations have an average of 43 percent of their populations under the age of 15, whereas other developing nations average 39 percent and developed nations average 22 percent below the age of 15.

These differences are displayed graphically in the accompanying age pyramids. Figure 7 shows the age-sex distribution for the Moslem population of the world. Among the 984 million Moslems of the world, 424 million (43 percent) are under the age of 15, while 34 million (3.5 percent) are aged 65 and older. The implications of this can better be appreciated by the comparison of a high-fertility nation (Pakistan), a lower-fertility developing nation (South Korea), and a low-fertility developed nation (Sweden). As can be seen in Figure 8, p. 36, Pakistan continues to have a classic pyramidal shape to its age structure, because substantial numbers of babies are still being added to the population each year. South Korea had a similar age-sex structure until very recently. Declining fertility has noticeably reduced the number of children relative to those of working age in the population. In Sweden, the longer history of declining fertility has

Figure 7. Age Structure, World Moslem Population, 1980s



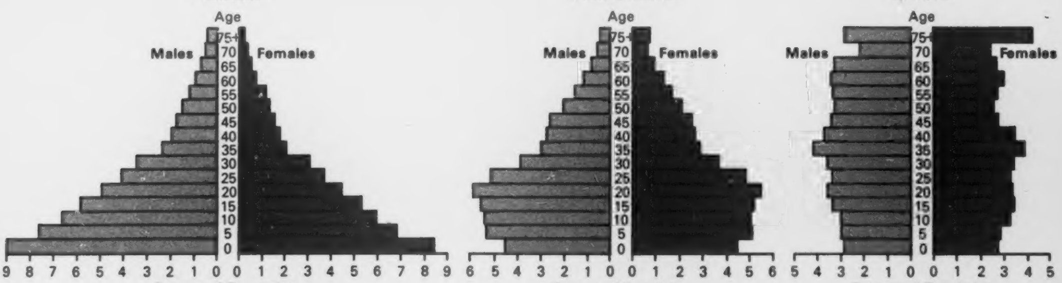
Source: Population Reference Bureau estimate produced an age-sex distribution that more closely resembles a barrel than a pyramid. As mortality continues to decline, the shape will become increasingly rectangular.

A very young population has substantial momentum for further growth. There are so many young people already of reproductive age, along with those children already born who will be moving through their childbearing years, that the absolute number of children that will be added to the population in the next few decades will be high, even if the average number of children born to each woman declines. Thus, it can be seen in Figure 9, p. 38, that the worldwide population of Moslems will continue to increase halfway through the next century, even if fertility were to drop to nearly replacement level (just enough children to "replace" their parents; around 2.1 children per couple in developed countries).

A population's built-in momentum for growth is not just an abstract concept. It rears its head constantly as a society has to accommodate an ever-expanding labor force, and provide food, shelter, education, health and other services to an ever-increasing number of citizens. Consider that in Pakistan alone, each year brings with it an additional 1.2 million young men aged 16, about ready to enter the labor force, whereas there are only about 150,000 men reaching age 65 each year (who might be retiring and thus opening up a job). All other things being equal, Pakistan must either create more than 1 million new jobs each year (about 85 jobs per 100 new labor force entrants) or face higher rates of unemployment or underemployment. By contrast, in Sweden there are an additional 60,000 young men coming of working age each year, at the same time that some 45,000 are reaching retirement age. Sweden's economy has a much easier time absorbing new workers, because it has to create only 25 new jobs per 100 new entrants into the labor force.

The potential economic impact of the age-sex structure is often measured by the dependency ratio—the ratio of people of dependent ages, usually 0-14 years and 65 and over, to people of labor force age, usually 15-64 years. In Pakistan this ratio is .89, which means that each person of working age has to support himself or herself plus .89 additional persons. Put another way, in Pakistan there is nearly one dependent per person of working age. This obviously puts a severe strain on family and societal resources and severely hinders the ability to improve one's economic position in life. In South Korea, declining fertility has produced a dependency ratio of .51, nearly half the level of that in Pakistan. In

Figure 8. Age Structure Comparison: Islamic Nation (Pakistan), Non-Islamic Developing Nation (South Korea), and Developed Nation (Sweden), 1985



Source: World Bank

Sweden, a long-term decline in fertility generates a dependency ratio of .51, the same as for South Korea, even though the shapes of the two age distributions are different. South Korea has relatively more children than Sweden, but relatively fewer older persons.

In the long run, it is probable that the smaller numbers of people that must be supported by each worker, the more a worker's labor can be invested to help improve the overall standard of living. Thus, a change in the age-sex structure can be an important factor in a nation's economic development strategy.

Population Growth and Economic Development

Economic development refers to a rise in the average per person income. It represents an increase in the standard of living; an improvement in the human condition. In general, economic development is occurring if the rate of economic growth exceeds the rate of population growth and if the national "profit" is being spread out over the entire population.[65]

There is no question that today's Islamic nations include some of the economically least advantaged countries in the world, as well as some of the economically more advantaged. In 1988 there were 17 Islamic nations (36 percent) in which the average per capita income per year was less than $500. There were 23 non-Islamic nations (18 percent) that fell into that category. Thus, Islamic nations were nearly twice as likely to fall into the lowest income grouping. At the other extreme, there were four Islamic nations in 1988 (9 percent) in which the average income was $10,000 or more per year, compared with 15 non-Islamic nations (12 percent). Thus, Islamic nations were 25 percent less likely than non-Islamic nations to be in the top income category.

Is there something about Islam that might hold back a nation's development? The answer to this question must categorically be "No." Islam has an implicitly practical approach to life and there is nothing in Islam that would prevent or necessarily even slow down the pace of economic development within a society. The very fact that four of the highest-income nations in the world (Brunei, Kuwait, Qatar, and the United Arab Emirates) are Islamic is evidence of this. The wealth of all four of these nations is based on oil, as is the wealth of Libya (for which we do not have income estimates), and of Oman and Saudi Arabia (where the average income is high, but not quite $10,000). Even if we exclude these seven oil-producing nations, World Bank data show that between 1965 and 1986, the average annual increase in per person income was higher in the remaining Islamic nations (an average increase of 1.8 percent per year) than it was in the other developing nations of the world (1.7 percent per year).[66] Among the oil-producing nations of Islam, the average annual increase in per capita income was 2.8 percent per year, a rate that is higher than the combined average for non-Islamic developed nations (2.5 percent per year).

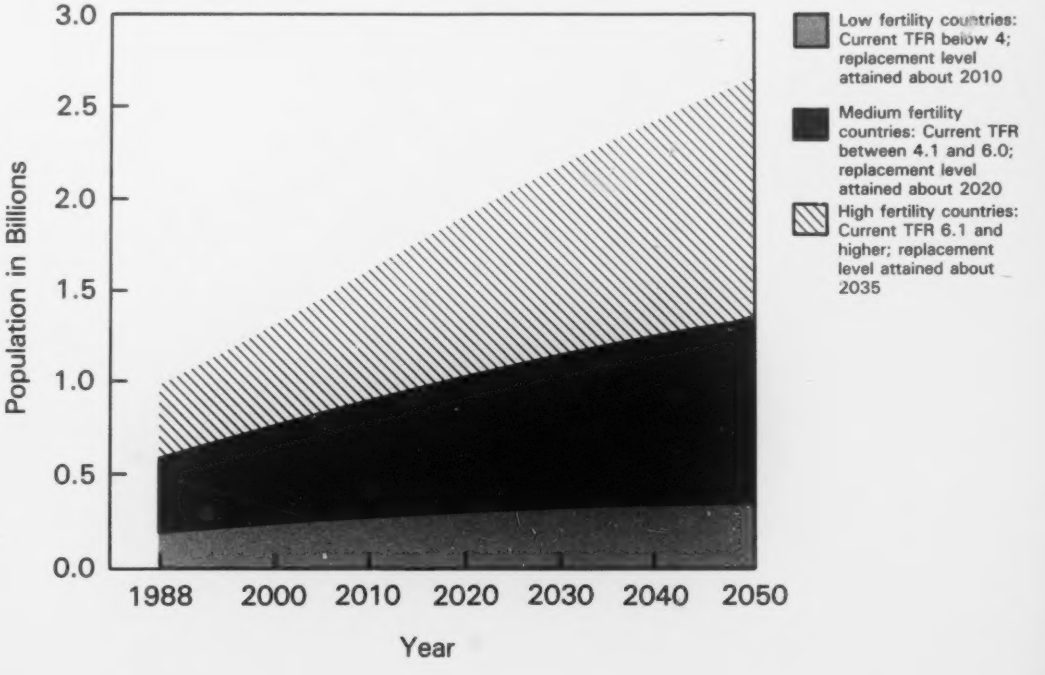
The data suggest, then, that the economies of the nations of Islam have been working harder than their counterparts in the non-Islamic world, but they have had a lot of ground to cover—a lot of economic catching up to do. One of the important underlying economic forces facing Islamic nations is the recency of independence.

For several centuries, virtually all of the modern Middle Eastern Islamic nations were a part of the Ottoman Empire, with headquarters in Turkey. Trade and commerce were important economic activities, but Europe was developing economically at a more rapid pace than was the Ottoman Empire. Furthermore, from the time of the Crusades to the present century, the predominantly Christian nations of Europe regularly had been at war with the Islamic nations of the Ottomans. Since most of the conflict over the centuries took place within the borders of the Islamic nations, their economic infrastructures suffered more than did Europe's.

By the beginning of the 20th century, European nations (especially Great Britain, France, Italy, Germany, the Netherlands, and Russia) had conquered, colonized, and had begun economically to exploit the resources of Islamic nations from sub-Saharan Africa all the way east to Indonesia. World War I completely polished off the power of the Ottomans, but Turkey re-established independence under Mustafa Kemal (later Ataturk) by declaring itself a secular republic. Under his presidency in the 1920s and 1930s, Turkey adopted the Latin script, abolished purdah, polygamy, and Islamic law, and adopted a European-style criminal and civil law. Turkey remained neutral in World War II, and moved into the postwar era as a participant in the European Recovery Program. Despite these massive changes, however, economic progress has been halting at best, regularly marred by political instability.

Turkey is 1 of only 4 of the world's 47 Islamic nations to have remained essentially independent since the beginning of the 20th century. The others are Ethiopia, Oman, and (until the Russian invasion in 1979) Afghanistan. During at least some part of this century, all 43 of the other Islamic nations had been under the direct colonial rule either of a European nation or, up to World War I, of the Ottoman Empire. In fact, of those 43 nations, 38 (88 percent) have gained independence from European domination

Figure 9. Projected World Moslem Population, 1988 to 2050 (countries grouped by current fertility level)



Source: Population Reference Bureau projections only since the end of World War II. As a result, the nations of Islam tend to be very "young," with an average "age" since independence of only 36 years.[67] By comparison, the average "age" of non-Islamic developing nations is 44 years, and 22 of these nations (almost all of which are in Latin America) have been independent since before the beginning of this century.

Since most of today's Islamic nations had been under European control during the time the Industrial Revolution was gathering steam, they missed out on the opportunity to play an independent role in that transformation. It is reasonable to argue that centuries of suppression and exploitation by either the Ottomans and/or various European nations produced Islamic nations that were economically underdeveloped as the world emerged from the Second World War. These countries have spent the time since independence trying to gain a toehold in a highly competitive economic milieu. Some have been more successful than others. Most, if not all, of these countries are in a stage that has been called "economic dependency," in which economic development of a nation is dependent more upon foreign capital than it is on internal savings.[68]

Development occurs, of course, in a wide range of contexts, as the data in Table 13 illustrate. It shows the average per person income levels for Islamic and non-Islamic developing nations according to geographic region. There is considerable variability from one region to the next, and the data suggest that region is the more important correlate of variability in income. Sub-Saharan Africa and Southern Asia are least well off economically, regardless of whether the nation is Islamic or not. Furthermore, in 3 of the 4 regions in which there are both Islamic and non-Islamic nations, the average income of Islamic nations is higher than for non-Islamic nations, due largely to the presence of oil-producing nations.

The rate of growth of per person income during the two decades from 1965 to 1986 shows similar kinds of patterns, as can be seen in Table 14, p. 40. The highest rates of income growth have occurred in Southeast Asia, regardless of whether the nations are Islamic or non-Islamic. The slowest economic growth has been in sub-Saharan Africa, regardless of whether the nations are Islamic or not. Western Asia has fallen between the two extremes, again regardless of whether the nations are Islamic or not. This latter comparison is particularly intriguing, because economic development among the Islamic nations of Western Asia has been highly dependent upon oil production, whereas the two non-Islamic nations of Cyprus and Israel have few oil resources. Yet their income levels (see Table 13) and rates of economic growth (see Table 14) are somewhat similar to the other, Islamic nations of the region.

Economic development has a significant effect in demographic analysis because it almost always brings lower fertility in its train. Other kinds of social

Table 13. Per Person Income of Islamic Nations Compared With Other Developing Nations in the Same Geographic Region

Geographic Region	Islamic Nations US$	Islamic Nations (no.)	Other Developing Nations US$	Other Developing Nations (no.)
North Africa	1076	(5)	*	
Sub-Saharan Africa	318	(14)	759	(26)
Western Asia	6046	(11)	5285	(2)
South Asia	273	(3)	247	(4)
Southeast Asia	5916	(3)	2247	(4)
Latin America	**		1873	(32)

* All North African nations are Islamic.

** All Latin American countries are non-Islamic.

Source: Population Reference Bureau, *1988 World Population Data Sheet* changes, such as the changing status of women, might also lower fertility, but it is important to remember that, from a policy point of view, a major reason for concern about fertility levels is that a high rate of population growth may impair a nation's ability to develop economically.

We analyzed data for all developing nations to assess the relative importance of demographic, religious, and regional factors in explaining a country's level of per person income in 1988. Using statistical analysis, we found, not too surprisingly, that 58 percent of the variation in per capita income among developing nations was explained by whether or not a country had oil, even when controlling for all other factors. In other words, in the short run at least, it does not matter how quickly your population is growing if you have enough oil to bear the cost of that demographic overhead. However, when the presence of oil is isolated during analysis, the rate of population growth emerges as the most important correlate of per person income, followed by one index of the status of women—the ratio of girls per 100 boys enrolled in secondary schools. The lower the rate of population growth and the higher the status of women, the higher is a developing nation's per person income. Population growth and the status of women combine to explain 13 percent of variation in national levels of per person income (in addition to the 58 percent of variation explained by whether or not the country was an oil producer). Neither being an Islamic nation nor geographic region is important in its own right as a predictor of income levels.

Finally, turning the relationship around, we asked how income influences fertility levels, when we control for Islam, geographic region, and the status of women. The answer, produced by regression analysis, was that per person income has little independent influence on fertility levels in developing nations. A far more important correlate of fertility levels was found to be a measure of the status of women. The higher the ratio of girls to boys enrolled in secondary schools, the lower the fertility. That variable alone, when controlling for income, Islam, and geographic region, accounted for 34 percent of the variation in the total fertility rate among developing nations. Whether or not the country was sub-Saharan explained another 10 percent in the variation in fertility—countries in sub-Saharan Africa having decidedly higher fertility, even controlling for income and whether or not the nation is Islamic. Being an Islamic nation gave an additional 7 percent in predictive power, after controlling for the effects of the status of women, geographic region, and income. Income, itself, was not a statistically significant predictor of fertility levels within the developing world, although income is strongly predictive of fertility levels on a worldwide basis, because the income gap between developed and developing nations (an average difference of more

Table 14. Average Annual Rate of Growth of Per Person Income of Islamic Nations Compared With Other Developing Nations in the Same Geographic Region, 1965-86

Geographic Region	Islamic Nations percent	(no.)	Other Developing Nations percent	(no.)
North Africa	2.4	(5)	*	
Sub-Saharan Africa	0.2	(11)	1.1	(21)
Western Asia	3.6	(7)	2.6	(1)
South Asia	1.4	(2)	2.2	(3)
Southeast Asia	4.5	(2)	4.0	(4)
Latin America	**		1.1	(21)

* All North African nations are Islamic.
** All Latin American countries are non-Islamic.

Source: World Bank, *World Development Report 1988* (New York: Oxford University Press, 1988) than $10,000) is as wide, in relative terms, as is the fertility gap (an average difference of 2.2 children per women as measured by the total fertility rate). Within the developing world, the differences between countries in income and fertility are not nearly as marked as are those differences between developed and developing nations.

Our analysis suggests, then, that short of finding oil on your back doorstep, lowering the rate of population growth and bringing women more strongly into the development process may help to improve national levels of per person income. This is a conclusion to which many, but not all, Islamic nations have come as they have grappled with the issue of population policy within their borders.

Population Policies in Islamic Nations

Population policies may be either direct or indirect. A direct policy is aimed specifically at influencing demographic behavior through the so-called proximate determinants. With respect to lowering fertility, a direct policy would be one that raised the legal age for marriage for women, or legalized abortion, or made contraceptives more widely available. An indirect policy is aimed at influencing the motivation of people to control family size, as when a government tries to discourage births by paying people not to have children (on some of the tea estates in India, for example), or encouraging births by paying people to have children (for example, by offering free maternity care and child allowances). An indirect policy tries to change behavior that is a known determinant of demographic behavior, in the hope that the net result will be the type of population change the government has in mind. When a government encourages the education of women, it is likely that the indirect effect will be a future decline in fertility. Most policies are a mix of direct and indirect measures designed to steer the nation's demographic course. Although our examples refer to fertility, population policy may also refer to mortality and migration as well. However, our concern in this report will be on policies oriented toward family size, since in Islamic nations that is the most crucial policy issue with respect to future population growth.

Policies dealing with reproductive behavior may have as their goal the increase, the maintenance, or the lowering of fertility levels and thereby growth rates. If the latter goal is paramount, the policy may try to produce a decline by increasing the motivation to limit family size and/or by increasing the availability and accessibility of methods by which fertility can be limited.

Islamic nations vary significantly in the governmental positions taken toward population growth. This variability is due in part to the ambivalence of Islam per se toward the topic of demographic change and population control, and in part to the fact that Islamic nations, like all nations of the world, are more likely to respond to demographic change on the basis of individual, community, and national self-interest than on the basis of ideology (whether it be religious or political). Joseph Chamie has noted that "due largely to Islam's structure—for example, the absence of an official religious head, such as the Pope, or a formal governing body—and to its primary reliance on the Koran and Hadith, each country, religious leader, or scholar is able to render an interpretation of Islam's stance on fertility and control. As a result, numerous differing 'official' statements dealing with Islam's position have been made."[69]

We have already seen that Islamic nations are not opposed to fertility control, although there are wide differences in whether and how family planning programs are promoted (as will be discussed below). There is considerable variability with respect to the position on abortions and sterilization. Of the 18 Islamic nations for which data were available in 1987, 7 (39 percent) permitted female sterilization on request, while 4 (22 percent) specifically prohibited it, and the remainder (39 percent) permitted it for medical reasons but not for purely contraceptive purposes.[70] Iraq permits sterilization on request, but only if a woman has already given birth to seven children, while Jordan requires a minimum of six children before allowing sterilization. Many non-Islamic nations have various restrictions on who may seek sterilization, but none has such a stringently high family-size requirement.

The variability of attitudes toward population growth among both Islamic and non-Islamic nations is apparent in Table 15. In half of the Islamic nations of the world, the government is satisfied with the present rate of growth, according to a recent United Nations survey.[71] In another 40 percent of the Islamic nations, the governments said that the rate of population growth is too high. Only 10 percent of Islamic nations report that the rate of growth is too low—a slightly smaller percentage than among non-Islamic developing nations. There are five Islamic countries in which the governments specifically say they feel that the rate of growth is too low—Iraq, Kuwait, Oman, Qatar, and Saudi Arabia—despite the fact that the annual rate of population growth in these four countries averages almost 3.2 percent, which is nearly twice the world average. Table 16 shows that it is the fastest growing Islamic nations that want to grow faster. Part of this is explained, however, by their relatively small size, and each has experienced an influx of foreign workers over the past few decades to help with oil production. At the time of the 1986 UN survey, Iraq was almost certainly concerned as well with its population size of 18 million relative to neighboring Iran's 52 million, given the war that was then raging between them.

The explicit statements of countries that their rate of growth is too low do not exhaust the pro-growth position among Islamic nations. Among those countries reporting to the United Nations that they were satisfied with current rates of growth, there were five who also indicated that they were engaged in efforts to raise the rate. Three were Islamic—Côte d'Ivoire, Mauritania, and the United Arab Emirates (the other two were Luxembourg and Romania). These three nations also have high rates of growth (an average of 2.9 percent per year) and Mauritania and the UAE each have less than 2 million population. Côte d'Ivoire, the former Ivory Coast, is one of the economically more prosperous sub-Saharan nations and has experienced a substantial in–migration of job-seekers from neighboring countries.[72] As in so many countries, the government of Côte d'Ivoire prefers population growth to occur from within the country, rather than (or at least along with) in–migration. Thus, there is an official government effort to boost the birth rate through meas-

Table 15. Official Government View of the National Rate of Population Growth, Islamic and Non-Islamic Nations

	Percent of Governments Saying that the Rate of Population Growth is: Too High	Satisfactory	Too Low	Number of Countries
Islamic Nations	40	50	10	38
Other Developing Nations	52	35	13	75
Centrally-Planned Economies	0	43	57	7
Developed Nations	0	84	16	25

Source: United Nations, *World Population Trends and Policies: 1987 Monitoring Report* (New York: United Nations, 1988) Table 3.5

Table 16. Rate of Population Growth and Size of Population, According to Government View of Rate of Population Growth, Islamic and Non-Islamic Nations

	Average Percent of Population Growth Per Year	Average Size of Population (millions)
Islamic Nations:		
Growth is Too High	2.6	51
Growth is Satisfactory	2.9	10
Growth is Too Low	3.2	9
Non-Islamic Developing Nations:		
Growth is Too High	2.5	59
Growth is Satisfactory	2.4	18
Growth is Too Low	2.2	6
Centrally–Planned Economies:		
Growth is Too High	n/a	n/a
Growth is Satisfactory	0.6	113
Growth is Too Low	0.2	15
Developed Nations:		
Growth is Too High	n/a	n/a
Growth is Satisfactory	0.4	31
Growth is Too Low	0.2	34

Sources: United Nations, *World Population Trends and Policies: 1987 Monitoring Report* (New York: United Nations, 1988); Population Reference Bureau, *1988 World Population Data Sheet.*

ures such as the provision of maternity benefits and child allowances.

Malaysia wants to prevent continued drops in its rate of growth, but this is connected to the political situation of having three major ethnic groups in the country. Fertility has been declining in Malaysia, as it has in most areas of East and Southeast Asia. Although some income-tax deductions and maternity benefits are being put into place to provide direct economic incentives to have children, the widespread availability of family planning in a country that has exhibited a range of motivations to limit family size will likely contribute to a continued drop in the birth rate. Fertility has declined among all three of the major ethnic groups in Malaysia—the Malays (who are predominantly Moslem), the Indians (who are predominantly Hindu), and the Chinese. The latter two groups have experienced the more rapid decline, but they are also more urban and educated than are the Malays. A recent rise in the birth rate in Malaysia created a stir, but it appears that it was actually a short-run consequence of Moslem women having postponed marriage (which contributed to the nation's overall fertility decline), but then marrying and having their first or second child, temporarily raising the birth rate, but not contributing to a long-term upswing.[73]

It is well documented, of course, that people do not necessarily respond to a government's wishes when those wishes are not in the peoples' best interest. Rarely, if ever, in human history have human populations voluntarily increased the birth rate because a government wanted such an action.[74] Nor do they necessarily limit fertility just because a government wants them to. Some significant motivation for lower fertility must be introduced into the environment and, where attitudes may be leaning toward lower fertility, a strong program of fertility control must be introduced and supported.

At least some of these elements are at work in the 40 percent of Islamic nations that expressed the belief that the current rate of population growth is too high. In Egypt, for example, the emphasis has been on making family planning services available. Private voluntary organizations opened family planning clinics in urban areas as early as the 1950s, although in order to obtain assistance a woman had to show that she already had three children, had obtained her husband's permission, and had a medical reason for seeking contraception.[75] As restrictive as that was, it still "helped set the stage for the far more massive government effort currently underway in Egypt, in which government health clinics dispense pills, IUDs, and other contraceptives, and outreach workers distribute contraceptives in rural areas."[76]

Indonesia is the Islamic nation that has probably made the greatest headway in reducing its rate of population growth. Between 1955/60 and 1987, the total fertility rate in Indonesia declined by 42 percent (from 5.7 to 3.3)—a drop exceeded in the Islamic world only by neighboring Malaysia's 44 percent (from 6.9 to 3.9). (During this interval of time, the average decline among all Islamic nations was 10 percent.) The immediate explanation for the drop in fertility was the rapid increase in contraceptive use among married couples of reproductive age—from 3 percent in 1971/72 to 48 percent in 1987.[77] In part this reflects the fertility decline throughout the region (among both Islamic and non-Islamic nations), but Indonesia has been a trendsetter within the region. The government philosophy toward population growth was expressed by President Suharto in 1984:

> To meet the three challenges of population [size, distribution, and quality], it seems that the principal solution lies in the implementation of a population-oriented development pattern, a development pattern in which population is both the subject and object of development. ... Improved quality of population and increased human capacity will further ensure the creation of a just and prosperous society in the future, in a world which will enable human beings to fully materialize their human potentials in order to lead a more fruitful life.[78]

Important to the success of the Indonesian family planning program has been the strong support of President Suharto and of Islamic religious leaders. "Suharto has provided political, administrative, legal, moral, and budgetary support. ... Of great importance has been Suharto's support for the family planning program's budget even when, as in 1986, government revenues were falling."[79]

The Indonesian government was also careful to consult with and enlist the help of Moslem leaders, many of whom initially were opposed to the concept of the family planning program for fear that it would violate Islamic traditions. First, the government omitted from the family planning program the two methods most opposed by Moslems: abortion and sterilization. Then government officials personally contacted religious leaders to explain the program and elicit their recommendations about implementation. "Once their attitudes toward the program became more positive, they were asked to help promote family planning. The shift among religious leaders from a stance of hostility to one of active support, seen in many parts of Indonesia, was a field triumph for the program."[80] Islamic leaders then assisted by assuring the community that family planning was in accordance with the Koran, by adding family planning messages into wedding ceremonies, and by actively telling individuals about the program.

In Indonesia it is clear that the motivation existed for a fertility decline (for a variety of reasons that are not yet well documented but especially in response to post-independence economic and social development). Islam here also adapted to earlier beliefs and practices; women always had a voice in decisions and were never isolated by purdah, for instance. The government's family planning program thus helped to accelerate a decline in fertility that was already on the verge of occurring.

Throughout the developing world, in Islamic and non-Islamic nations, there are few examples of governments successfully trying to motivate couples to limit fertility. Some countries may echo the sentiments of Syria's President Hafez Al-Assad who commented in 1984 that, in Syria, "the great improvement expected in education, *especially for females*, will affect fertility rates, and will result in the decline of population growth rates" [emphasis added].[81] Within Islam there is a growing awareness of the changing role of women in society, and there is recognition of the changing structure of reproductive behavior that is implied by the gender role changes. Another basic element is that as mortality declines, both children and adults survive longer. Bringing the number of live births down to a "comfortable" level can still result in a family structure that is demographically more stable than anything ever imagined under the old regime of high mortality and high fertility.

While the motivational component of fertility limitation may be left to indirect measures, the availability of the means of fertility control is usually dependent upon direct governmental support. One way of measuring this is to employ the index of family planning program effort developed by Robert Lapham and W. Parker Mauldin.[82] The program effort score assigns values to each of the following components of a successful family planning program: (1) policy and stage-setting; (2) services; (3) record-keeping and evaluation; and (4) availability and accessibility. The scores for each component are summed to produce an overall index of family planning program effort. Scores can range from zero (no effort) to 120 (maximum effort). Using this method, they found that China produced the highest score (101), while Libya, Kampuchea, and several other nations had scores of zero.

Islamic nations have program effort scores that average less than those of other developing nations (see Table 17). In general, scores for developing nations average only 28, which would be counted a "weak" effort in the classification scheme. Nonetheless, Table 17 also shows that there is a consistent pattern in both Islamic and non-Islamic nations for the program effort score to go up as the government position on population growth goes from "too low" to "too high." Certainly there is room for considerable improvement in program effort in nearly all developing nations in Africa and most of Asia, especially in those nations which have indicated that they would like to lower their overall rate of population growth. All of the data available to us suggest that Islamic nations are as likely to respond to this challenge as are non-Islamic nations and the nature of the response will more likely reflect a nation's socioeconomic and sociocultural conditions than it will be based on that nation's predominant religious group.

Table 17. Family Planning Program Effort Score, According to Government View of Rate of Population Growth, Islamic and Non-Islamic Nations

	Family Planning Program Effort Score
Islamic Nations:	25
Growth is Too High	38
Growth is Satisfactory	18
Growth is Too Low	4
Non-Islamic Developing Nations:	41
Growth is Too High	46
Growth is Satisfactory	38
Growth is Too Low	30

Sources: United Nations, *World Population Trends and Policies: 1987 Monitoring Report* (New York: United Nations, 1988); and Robert J. Lapham and W. Parker Mauldin, "Contraceptive Prevalence: The Influence of Organized Family Planning Programs," *Studies in Family Planning*, Vol. 16, No. 3 (May/June 1985) Table 1

Conclusion

In this *Bulletin* we have examined the demographic situation in 47 Islamic nations, focusing primarily on the causes and consequences of population processes (fertility, mortality, and migration), population composition, population growth, and population policies. Based on the best estimates available, we identified and included in this study the 40 nations in which a majority of the population adheres to Islam and another seven nations in which a significant minority (25 to 49 percent) of the population is Moslem. By geographic region, 22 of these Islamic nations are in the Middle East (7 in Northern Africa and 15 in Western

Asia), 17 are in sub-Saharan Africa, 4 in Southern Asia, 3 in Southeast Asia, and 1 (Albania) in Europe.

To place the demographic situation of the Islamic nations in its proper perspective, our analysis focused on comparing the demographic variables in Islamic nations (virtually all of which are developing nations) with the corresponding variables in other, non-Islamic developing countries, nations with centrally-planned economies, and developed nations. Furthermore, within each region we compared the demographic situation of the Islamic nations with that of the non-Islamic nations.

Overall, we found that the Islamic nations had higher fertility and mortality levels, higher rates of population growth, higher percentages of young people (under 15 years of age), and higher percentages of rural people than other categories of nations. In general, as a group, the nations of Islam may be placed in the early stages of the demographic transition, characterized by high fertility, declining mortality, and rapid population increase. However, these demographic generalizations conceal noticeable regional and temporal diversity in fertility, mortality, and population growth among the Islamic nations.

Fertility and mortality rates are highest for those Islamic nations in sub-Saharan Africa. Yet the fertility and mortality of non-Islamic sub-Saharan African nations were higher than those of the Islamic nations in other regions. Thus, regardless of whether a nation is Islamic or not, being in sub-Saharan Africa is associated with high fertility and high mortality. In Southeast Asia the three neighboring Islamic nations of Indonesia, Malaysia, and Brunei have fertility levels that are well below those of other Islamic nations in the world, as well as being lower than most other developing nations in their region. Furthermore, during the past 30 years, fertility dropped substantially in the Islamic nations of Southeast Asia, as it did in other nations in the region. Fertility also declined noticeably in North African Islamic nations and to some extent in Western Asian nations as well. In Southern Asia, there has been only a very small fertility decline among both Islamic and non-Islamic nations.

Our conclusion is that whether the nation is Islamic or not, regional differences seem to be important in explaining fertility levels. This is clearly evident in the considerable regional diversity in contraceptive use and in the percentage of teen-aged women who are married in both Islamic and non-Islamic nations. The results of our statistical analysis showed that among the developing countries the most important factor explaining the differences in contraceptive use and in teen-aged marriages was a geographic one—specifically, whether the country was in sub-Saharan Africa, regardless of whether the country was Islamic or non-Islamic. This analysis also revealed that contraceptive use is by far the most important of these variables in explaining between-country differences in fertility levels. After controlling for contraceptive use, the proportion of teenagers who are married, and geographic region, there was nothing unique about Islamic nations that could explain the differences in fertility.

Our study also supports the proposition that the relatively high mortality levels in Islamic nations has nothing to do with Islam. Rather, it is a function of economic disadvantage. In both Islamic and non-Islamic developing countries, life expectancy increases with the increase in per capita income of the nation. Infant mortality rates and maternal mortality rates are also highly sensitive to national per person income levels. We also found variations in mortality levels by region, since some geographic zones are by nature (quite literally) less hazardous than others.

Migration in Islamic countries has been fairly commonplace for a long time. We have examined briefly three important types of migration in Islamic nations: guest-worker international migration, rural-to-urban migration, and forced refugee migration. In general, the guest-worker programs have been demographically beneficial to both sending and receiving nations. Rural-to-urban migration in some Islamic nations has led to the rapid growth of cities, growth that cannot be supported by the city's infrastructure. Refugees in Islamic nations represent two-thirds of the world's 13 million refugees.

An important issue which we have examined in this study is the relationship between population growth and economic development. There is no question that the Islamic nations include some of the economically least-advantaged countries in the world, as well as some of the economically more advantaged. Our analysis indicates that there is nothing about Islam per se that might hold back a nation's development. On the contrary, the data suggest that the economies of the nations of Islam have been working harder than their counterparts in the non-Islamic countries, but they have had a lot of economic catching up to do in order to overcome several centuries of deprivation and exploitation during the periods of foreign occupation and colonization.

In the period since the mid-1960s, the rate of income growth per person has varied considerably from one region of the world to another. Among developing nations the highest rates of growth have occurred in Southeast Asia, regardless of whether the nations are Islamic or non-Islamic. The slowest income growth has been in sub-Saharan Africa, again regardless of whether the nations are Islamic or not. Western Asia has fallen between the two extremes, regardless of whether or not the nations are Islamic.

In reviewing population policies in Islamic nations we found that, like all nations of the world, they vary considerably in governmental positions on reproductive behavior and population growth. In 40 percent of the Islamic nations, the governments expressed the belief that the current rate of population growth is too high. Another 50 percent of governments were satisfied with their present rate of population growth. Only 10 percent of Islamic nations have governments that specifically say that the rate of population growth is too low. Not surprisingly, then, Islamic nations also vary widely in whether and how family planning programs are promoted. In a few Islamic nations pronatalist governments have been wary of making fertility control measures widely accessible. On the other hand, the governments of many more Islamic nations are implementing family planning programs, or are supporting the efforts of voluntary family planning associations, or at least permitting the distribution of contraceptive methods in public and private medical and health care facilities. Some Islamic nations, including Indonesia, Tunisia, Egypt, and Turkey, have been making impressive headway in promoting contraceptive use and reducing fertility rates. Obviously, there is room for considerable improvement in program effort, not only in Islamic nations, but in all developing countries. Yet, all of the data available to us suggest that Islamic nations are as likely to respond to this challenge as are other developing nations.

Overall, our demographic journey leads us to the conclusions that: (1) there is considerable diversity among Islamic nations; and (2) there are few demographic patterns in Islamic nations that appear to be a direct result of religious influence. We noted at the beginning of this *Bulletin* that the demographic interest in Islamic nations lies especially in the high fertility levels that prevail in most (but certainly not all) countries in which a large fraction of the population is Moslem. The evidence seems to point clearly to the conclusion that it is not Islam itself that produces this result. This conclusion is shared by many scholars, [83] but we should note that not all would agree.[84] Nonetheless, in our view, the high fertility found in many Islamic nations is more likely a consequence of the recency of social and economic development in nearly all Islamic nations. Thus, the major impediment to the process of demographic transition in these nations seems to be the lateness with which they started the process of social and economic development. It is difficult to make up ground, socially and economically, when the population pressure is incessant, as it is when mortality continues to decline at least as rapidly as fertility is declining. The young age structure that is produced by higher-than-average fertility combined with declining mortality not only pushes a nation's resources to the limits right now in attempting to educate, clothe, feed, house, and find jobs for a greater number of people each year; it also has a built-in momentum for growth that will continue to produce ever greater numbers of babies each year even though the overall levels of reproduction may be falling.

Governments of all Islamic nations are aware of these interrelationships and only those with higher-than-average incomes continue to press for high rates of population growth. Even in the few countries where the government is pronatalist, an increase in the age at marriage is at work to lower fertility and that will almost certainly be followed by an increase in the use of contraception to space children within marriage, which may eventually lead to the use of contraception to limit family size within marriage. Social change may take place slowly in traditional societies, but once it begins, it usually gains its own momentum. ☐

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Box 2. Can We Estimate the Size of the Moslem Population in the United States?

Among the five most populous nations of the world, the United States has by far the fewest Moslems. Of that fact we can be certain. But, what *is* the number of Moslems in the United States? That turns out to be a difficult question to answer. Neither the census nor any other large national survey collects reliable data on religious preference. Although some data do exist on church attendance, Islam does not require attendance for formal membership in the way that many Christian groups do. There is also no major minority group that can be identified as being predominantly Moslem (as is true, for example, in China and the Soviet Union). How then do we arrive at a reasonable estimate or range of values within which the actual number of Moslems in America is apt to lie?

One source of estimates is that developed by Richard Weekes, whose 1983 estimates formed the basis for the data in Table 1 and Figure 1 of this *Bulletin.* He estimates that there are approximately 1.5 million Moslems in the United States (see Table). Professor Weekes provides no specific sources for these U.S. estimates, although they appear to be derived by consensus among professional anthropologists. The "undetermined" category apparently refers to non-black Americans who have converted to Islam and are not members of one of the other groups listed in the Table. Note that one assumption underlying these estimates is that for groups such as Arabs, a high proportion of migrants to the U.S. are non-Moslems. This may be less true today than it was even a decade or so ago. If we were to assume that a higher percentage of Arabs, South Asians, and Persians in the United States are Moslem, then the estimate of the Moslem population obviously would be higher. For example, if we assume that 75 percent of Arabs are Moslem (rather than 10 percent) and that 75 percent of Persians (Iranians) are Moslem (rather than 50 percent), the estimate increases from 1.5 million to 3.4 million. Other assumptions about the percentage of Moslems in each group will yield correspondingly different estimates of the total size of the U.S. Moslem population.

Another estimate has been published by Yvonne Haddad of the University of Massachusetts.[1] She quotes the work of two other American researchers, each of whom independently has estimated the U.S. Moslem population circa 1986 to be approximately 3 million. This, of course, is very similar to the figure generated above by changing some of Professor Weekes' assumptions.

More recently, the May 23, 1988 issue of *Time* magazine quoted an estimate of 4.6 million Moslems in the United States. This figure was derived from a study by Carol Stone, a doctoral student at Indiana University, who presented her estimates in a paper at a symposium organized by Professor Haddad. Although that number has received considerable publicity, there is some question as to its accuracy. Professor Haddad believes it may be too high because it relies on what may be unrealistically high proportions of immigrants from Moslem-majority nations being assumed to be Moslem. Nonetheless, Professor Haddad notes that because of continued migration of Moslems to the U.S., along with higher-than-average fertility among Moslem immigrants and converts, it is possible that the Moslem population of the U.S. could reach 6 million by the year 2000.[2]

Islamic leaders within the U.S. are more inclined to accept Ms. Stone's estimate of 4.6 million as reflecting the current or even minimum size of the Moslem population in the U.S. There are more than 600 mosques or Islamic centers in

Group	Percent Moslem	1983 Total Number of Moslems
American Blacks	2	500,000
Arabs	10	300,000
South Asians	11	100,000
Turkic	100	25,000
Persians	50	25,000
Albanians	25	8,000
Malays	100	6,000
Undetermined	—	500,000
Total		1,464,000

America and informal counts of the number of people coming to pray and to break the fast during Ramadan have suggested to some individuals that the number of Moslems may already exceed 5 million in the United States.[3] Sharifa Alkhateeb, a Washington, D.C. social scientist, notes that most estimates of the U.S. Moslem population do not sufficiently take into account the offspring of Moslem migrants, nor the conversion and reproduction of other Americans, especially American blacks.[4] It should be noted that many American Black Moslems are integrated into the mainstream of Islam in the United States, while others are followers of Minister Louis Farrakhan's Nation of Islam.[5]

In the absence of more certain information, it is probably reasonable to assume that, as of 1988, the Moslem population of the United States was somewhere between 1.5 and 6 million. It is certain, however, that the Moslem population is growing numerically at a more rapid rate than the population as a whole, and there are concerted efforts currently underway by Islamic groups to increase the public awareness of Islam in America.

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Discussion Points

1. Characterize the demography of Islamic nations in comparison with other developing countries and developed nations. Consider variables such as fertility and mortality, urbanization, education, and age composition. If possible, consult PRB's *World Population Data Sheet* for additional information.

2. What tenets of the Islamic religion might directly or indirectly account for the high fertility levels found in Islamic nations? Compare other major religious traditions on the question of fertility control.

3. Outline the demographic profile of the oil-producing Islamic nations. Compare this profile to those for other Islamic countries, developed countries, and countries with centrally-planned economies.

4. What cultural norms in Islamic society have an impact on the four factors—Bongaarts' Proximate Determinants—that affect fertility?

5. An improvement in the status of women usually leads to lower fertility in a society. How can changes in the status of women affect the proximate determinants of fertility?

6. Demographers refer to the shift from high fertility and mortality to low levels as the "Demographic Transition." Using Figure 2, explain the Islamic nations' position in this transition and compare it with other developing countries and the United States.

7. Demographers refer to the ratio of young people (ages 0-14) and older people (those 65 and over) to the working age population (ages 15-64) as the "dependency ratio." Using Pakistan as an example, characterize the dependency ratios of Islamic nations in comparison with other developing countries and developed nations.

8. The author of the *Bulletin* argues that factors *other* than Islamic religion are of prime importance in the high fertility of Islamic nations. How does he substantiate this argument? Do Islamic nations differ demographically from non-Islamic populations in the regions in which they are located?

9. Many Moslems are guest-workers or migrant laborers in other countries. Describe some of the main migration streams and discuss their consequences for both host and sending countries as well as for migrants and their families.

Prepared by Kimberly Crews

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Two Hundred Years and Counting: The 1990 Census

By Bryant Robey

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Abstract—On April 1, 1990, the United States will take a national census, marking 200 years of census taking in America. A national census has been taken every ten years in the United States since 1790. Mandated by the U.S. Constitution, the decennial census is the basis for reapportionment of the House of Representatives. California, Texas, and Florida are expected to gain the most Congressional seats following the 1990 Census, reflecting above-average population growth in these states. The census also provides important information about the characteristics of the American people, and a growing number of federal, state, and local government programs, private corporations, and community agencies use census data.

Each census provides a portrait of America, and over the decades these portraits have revealed much about how our country has changed as we have grown from a young agrarian nation of about 4 million people clustered along the Eastern seaboard to a complex post-industrial society of nearly 250 million spread across the continent and beyond.

Techniques for taking the census have steadily improved over the past two centuries. The 1990 Census will rely heavily on computerization in all its aspects, including field operations, processing, geography, data tabulations, and products. It is likely to be the most accurate census in our history. The 1990 Census is already the subject of a lawsuit, however, charging that minority groups will be counted less completely than the white population. A series of similar lawsuits followed the 1980 Census, but all were unsuccessful.

This *Bulletin* discusses the Census Bureau's plans for taking the 1990 Census, looks back on 200 years of census taking in America, and details such key aspects of the 1990 Census as the questionnaire, census geography, and data dissemination plans. It also examines such issues as census undercount and the homeless population that will be particularly important in the coming census.

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Two Hundred Years and Counting: The 1990 Census

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U.S. CENSUS
FIELD DIVISION

U.S. Bureau of the Census

The 1990 Census will mark 200 years of census taking in the United States. A complete enumeration of the population has been carried out every 10 years since 1790.

Two Hundred Years and Counting: The 1990 Census

By **Bryant Robey**

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April 1, 1990 is Census Day. A census has been taken in the United States every ten years beginning in 1790, in good times or bad. Two hundred years of census taking is a major achievement.

Our first census was taken nearly ten years before the first census in any European country except Sweden. The 19th century French statistician, Moreau de Jonnés, declared that the United States represented an unparalleled historical phenomenon: "that of a people who instituted the statistics of their country on the very day when they founded their government."[1]

The requirement for our national census is contained in only a few words of the U.S. Constitution, but a few words from the Constitution count for a lot:

> Representatives . . . shall be apportioned among the several states which may be included within this union, according to their respective numbers . . . The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years in such manner as they shall by law direct. . . .
>
> [Article I, section 2]

While the Constitutional purpose of the census is to provide an enumeration to determine how many seats each state will fill in the House of Representatives, the census has always been more than a headcount. It provides a report every ten years on the "state of the nation" and thus permits us to monitor social and economic patterns over time. We have the decennial census to thank not only for maintaining representative government but also for supplying much of what we know about how our country has changed during the past two centuries.

As America has grown from a young agrarian nation of 4 million people clustered along the eastern seaboard to a complex post-industrial nation of 250 million spread across the continent and beyond, the census has charted our growth.

Today, the modern census provides data that are of interest to millions of Americans in all walks of life. Census data are used to allocate billions of dollars of government benefits to states, cities, and counties. Many government assistance programs use census data as part of their allocation formulas. The private sector of the economy depends on census data for efficient corporate planning, marketing, and forecasting consumer demand. Local governments, school systems, universities and colleges, hospitals, and community service agencies all use information from the census.

In the nation's early days, censuses were far less precise affairs. For the first nine censuses, U.S. marshals tallied the population. It was not until 1880 that special enumerators were hired. The Census Bureau was established as a permanent department of government only in 1902.

Over the years, technological advances in sampling techniques, operational methods, tabulation technologies, and information systems have been adopted. The punch card and electric tabulating system that predated the computer were created by R. Herman Hollerith, a former Census Bureau employee, and first used in the Census of 1890. His company was one of the three firms which merged in 1911 to eventually become the International Business Machines Corporation, IBM. The Census Bureau pioneered the development of the computer for mass data processing, using UNIVAC-1 in the 1950 Census. And today, the 1990 Census relies heavily on modern computer technology. Still, census taking remains a labor-intensive activity. Over half a million people will

U.S. Bureau of the Census

Hollerith card-punching machines were used to code census results before the advent of electronic computers.

Box 1. Why is the Census Important?

Why is the decennial census so important? Theodore G. Clemence, a senior official of the Census Bureau, and a student of census history until his death in 1988, summed up the importance of the census as follows:

"The decennial census was instituted with the founding of the American republic both to settle the protracted dispute between large and small states about the distribution of power, and to promote a core principle of political democracy: that such power must be redistributed periodically and peacefully if our system of government was to endure . . .

The political function of the national census rapidly acquired a companion function: the quest for knowledge, fulfilled by the 10-year statistical portrait of the people and the economy. These portraits were a source of pride for an expanding nation, and a description of problems to which American ingenuity could be applied. In time, the importance of the census led to reforms in its operations, and laid the foundation for a permanent Census Bureau.

The most recent census, in 1980, reflects a third function coming of age: the social value of participating in the census, not just as respondents to questionnaires, but as stakeholders influencing the rules of the enterprise before it begins, becoming involved in the operation, and even in helping to validate the usefulness of census results.

These three values of the census—political representation, knowledge, and participation—acquire their own momentum in practical actions. While statisticians evaluate the methods of operation and the accuracy of census results, and lawyers argue the fine points of performance in court, the House of Representatives is reapportioned, state legislatures are redistricted, and tens of thousands of data users find what they want to know and decide what they want to do about problems, opportunities, public issues, consumer markets, corporate plans, affirmative action, education, urban revitalization, and many more.

In 200 years, the value of the decennial census has been woven into the fabric of national life. A reader of the Voting Rights Act or the Supreme Court decisions on one-person, one-vote, could hardly believe otherwise, regardless of his political opinions. A legislator remarked, a century ago, that a country without a census cannot be well governed. Perhaps he was right."

Source: Theodore G. Clemence, "Historical Perspectives on the Decennial Census," *Government Information Quarterly*, Special Issue: Symposium on the Decennial Census, Volume 2, Number 4 (November 1985) pp. 355-368.

work for the Census Bureau on a temporary basis during the 1990 Census.[2]

Most Americans do not know much about the census. Unlike other civic duties, such as voting or paying taxes, participating in the census demands so little time and attention that most people will not recall having participated in previous censuses when it comes time to answer the 1990 Census. In an effort to increase awareness of the national enumeration and enlist everyone's cooperation, the Census Bureau will conduct an intensive public relations campaign to get people to answer the census. It will assure us that personal identities are kept confidential and that answering the census questionnaire is in the public interest.

Many Americans do not believe the government's assurance of confidentiality or concern themselves with the public interest. Our population is constantly on the move; people do not stand still to be counted; some people go out of their way to avoid being counted. Most census enumerators are temporary employees, without enumeration experience. They are human and make mistakes. For all of these reasons, the census is an imperfect instrument.

Accuracy has increased with each successive census, however. The Census Bureau estimates that it missed 4.4 percent of the population in 1950, 3.3 percent in 1960, 2.9 percent in 1970, and 1.4 percent in 1980.[3] This is an impressive record, given the enormous difficulty of the Census Bureau's assignment. The 1990 Census is likely to be the most accurate in the nation's history. Nevertheless, it may miss counting two or three million people.

The 1980 Census figures were challenged in more than 50 lawsuits alleging that localities with a higher-than-average share of black and Hispanic residents were injured by the undercount. Although the Census Bureau won all of these lawsuits, already a new suit has been filed in the expectation that the 1990 Census will miss so many people that unequal representation and misallocation of government benefits will result.

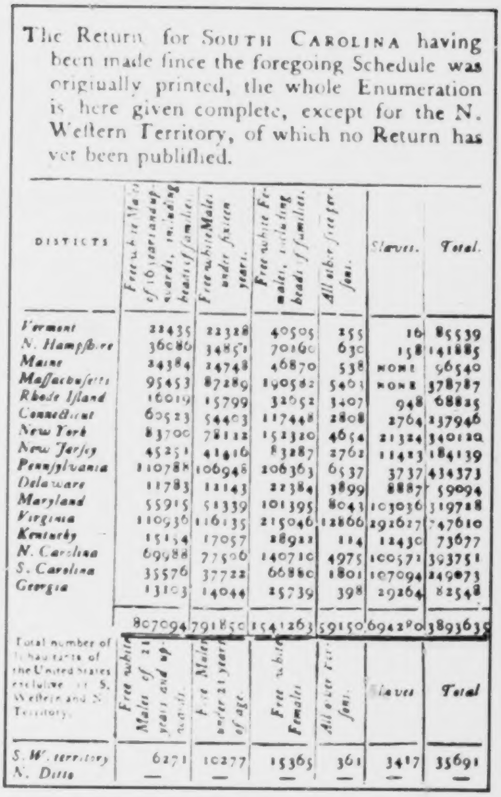
Modern census taking is a multi-billion-dollar activity in which the opportunity for error is ever present, but in which error is not tolerated. So difficult is it to manage the decennial census that last year a book about federal political appointments included the Census Director's job as one of Washington's "prunes," the opposite of a political "plum."

Ultimately, the quality of the census and the accuracy of census data depend on the cooperation of the American people. It is our responsibility to answer the census, and to provide truthful responses. Without the public's support, the census cannot succeed. This has been true for 200 years.

Two Centuries of Population Change

America in 1990 bears little resemblance to the America of 1790, or to the America of 1890 for that matter. In 1790, if all went well, a person could travel from New York to Washington in eight days by horseback or coach. That's how long it took George Washington to go from his home outside what is now Washington, D.C. to New York City for his inauguration as President in 1789.

Figure 1. Results from the First Census, 1790



The Return for SOUTH CAROLINA having been made ſince the foregoing Schedule was originally printed, the whole Enumeration is here given complete, except for the N. Weſtern Territory, of which no Return has yet been publiſhed.

DISTICTS	Free white Males of 16 years and upwards, including heads of families.	Free white Males under ſixteen years.	Free white Females, including heads of families.	All other free perſons.	Slaves.	Total.
Vermont	22435	22328	40505	255	16	85539
N. Hampſhire	36086	34851	70160	630	158	141885
Maine	24384	24748	46870	538	NONE	96540
Maſſachuſetts	95453	87289	190582	5463	NONE	378787
Rhode Iſland	16019	15799	32652	3407	948	68825
Connecticut	60523	54403	117448	2808	2764	237946
New York	83700	78122	152320	4654	21324	340120
New Jerſey	45251	41416	83287	2762	11423	184139
Pennſylvania	110788	106948	206363	6537	3737	434373
Delaware	11783	12143	22384	3899	8887	59094
Maryland	55915	51339	101395	8043	103036	319728
Virginia	110936	116135	215046	12866	292627	747610
Kentucky	15154	17057	28922	114	12430	73677
N. Carolina	69988	77506	140710	4975	100572	393751
S. Carolina	35576	37722	66880	1801	107094	249073
Georgia	13103	14044	25739	398	29264	82548
	807094	791850	1541263	59150	694280	3893635
Total number of Inhabitants of the United States exclusive of S. Weſtern and N. Territory.	Free white Males of 21 years and upwards.	Free Males under 21 years of age.	Free white Females	All other Perſons.	Slaves	Total
S. W. territory	6271	10277	15365	361	3417	35691
N. Ditto	—	—	—	—	—	—

Source: *Return of the Whole Number of Persons Within . . . the United States . . . [1790 Census]* (Philadelphia, J. Phillips, 1793).

Note: All other free persons included American Indians taxed, free blacks, and persons of other races.

The nation's largest city, New York, had a population of 33,131 in 1790. The capital, Philadelphia, was second with 28,522 (Washington, D.C. became the capital in 1800). Boston had the third largest number at 18,320. Only six cities contained more than 8,000 people. Just over 5 percent of the total population lived in urban areas, using the current definition of 2,500 and more residents.

The 1790 Census, taken by the 16 U.S. marshals and their 650 assistants, counted 3,929,326 people, including 697,699 slaves, or one slave for every 4.6 free people (see Figure 1). "Indians not taxed" were not included in the census count. Most of the territory west of the Allegheny Mountains was virtual wilderness, home to only 5 percent of the total population. But America in 1790 stood at the threshold of vigorous expansion.

A century later, the census takers of 1890 saw themselves as chroniclers of the historic peopling of the American continent. "This census completes the history of a century of progress and achievement unequaled in the world's history. The century has witnessed our development into a great and powerful nation," the introduction to the 1890 Census reports.

The Atlantic states were "the sources of supply for a great westward migration. Their children have peopled the great interior valley and the mountains of the west," the Census Bureau proclaimed. "They have swarmed from the Atlantic coast to the prairies, plains, mountains, and deserts by the millions during the last century."[4]

In its first century, America's population grew phenomenally. By 1890, the population had grown to some 63 million people. In every decade but two between 1790 and 1890, the population increased by at least 30 percent. The population of the U.S. passed that of England and Wales by 1840.

In 1890, New York City was still the nation's largest city, with a population of 1.5 million. Philadelphia had dropped to third, behind Chicago, and each of these two cities had just over one million residents. Brooklyn, merged with New York City in 1898, was fourth in population with 806,000. Eleven cities had more than 250,000 people, another 17 were between 100,000 and 250,000, and 96 were between 25,000 and 100,000. Between one-fifth and one-fourth of Americans lived in "urban" locations by 1870. Still, we were predominantly a nation of small towns and rural places. About 1,000 places had a population between 2,500 and 5,000; another 1,600 were between 1,000 and 2,500; and nearly 5,000 contained fewer than 1,000 residents.

And although almost everyone in the first few decades of the 1800s worked in agriculture, by 1880 the census reported that half the U.S. work force was in manufacturing, trade, transportation, mining, or service industries.

Average family size in 1890 was still very large by today's standard, but it had declined from 6 persons per family in 1790 to under 5. The median age recorded by the 1890 census was 22 years (the 1790 Census did not ask a question about age, but median age for the white population in 1800 was estimated to be just 16 years).

In 1790, the population density of enumerated areas was fewer than 10 persons per square mile. By 1890, the figure had risen to 80 for the same area. The 1890 Census counted 28.2 million people in the area originally enumerated in 1790. In addition, 34.8 million people lived in territory added to the United States since the 1790 Census. The Census of 1880 was the first to find more Americans living in the area outside the original territory than within it, as Americans moved westward. (See Figure 4, page 26.)

By 1890, the continental United States

Table 1. America's Changing Population, 1790 to 1990

Year	Population (thousands)	Places with 50,000+ persons	Median age (years)	Average number of persons per household
1790	3,929	0	—	5.79
1840	17,069	5	17.8	—
1890	62,948	58	22.0	4.93
1940	131,669	200	29.0	3.67
projections				
1990	249,891	470	33.0	2.65

Source: U.S. Bureau of the Census and Population Reference Bureau, Inc.

consisted of 44 states and the territories that were to become Arizona, New Mexico, Oklahoma, and Utah: It was populated from coast to coast, ocean to ocean. There were no more vast expanses of unsettled land; the wilderness had been tamed. Census officials declared the end of the American frontier.

What the 1990 Census Will Show

Another 100 years has passed, a century characterized no longer by geographic expansion but instead by the economic and social transformation of the nation.

The national population growth rate has slowed considerably in comparison to the 1800s. The 1980 Census counted a total population of 226.5 million. For 1990, the Census Bureau projects a population of 249.9 million, 10.3 percent more than in 1980.

As the economy has changed and the large industrial cities of the Northeast and Midwest have peaked, the population has grown most in California, Texas, and Florida. The 1990 Census probably will confirm that these three states account for over half of the nation's total population growth during the 1980s. Projections have the Northeast growing less than 3 percent and the Midwest only 1.5 percent during the 1980s, while the South will gain nearly 16 percent and the West, 21 percent.[5]

California, Texas, and Florida together will have a 1990 population of nearly 60 million, almost as many people as lived in the nation as a whole a century ago, in 1890. (See Table 2.)

The national median age in 1980 was 30 years. By 1990, the median age is projected to rise to 33 years. Census Bureau projections anticipate a continued rise in the median age into the next century, as life expectancy rises, the birth rate remains low, and the baby-boom generation (the more than 75 million Americans born between 1946 and 1964) grows older. By 2010, the median age will be 39 years.[6]

We have become a nation of small households, with fewer children per family, fewer families as a percentage of all households, and more people living alone. The population grew 11 percent between 1970 and 1980, while the number of households grew 27 percent. The 1980 Census was the first in history to record an average household size of fewer than three people. In 1980, the average family contained 3.3 persons. By 1990, the typical American family—if it is still possible to speak of a typical family—probably will consist of only three people.[7]

Immigration has provided the United States with over 50 million new residents during the past two centuries, but the great majority of these new Americans arrived before the 1920s. A century ago, the 1890 Census recorded that nearly 15 percent of all Americans had been born abroad; by 1980, the proportion had dropped to just 6 percent. But of late the proportion is rising once again because American fertility is at record lows while the number of immigrants has risen rapidly in the past 20 years. The Census Bureau estimates that immigration accounted for 28 percent of the nation's total population growth in the first half of the 1980s.[8]

Successive waves of immigrants, followed by generations of intermarriage, have altered the nation's ethnic and racial character. Over two-thirds of all immigrants to the U.S. have come from Europe. So great has been intermarriage among them that only 11 percent of Americans counted by the 1980 Census listed their sole ancestry as English. Only 8 percent said they were exclusively German. However, some 50 million, or more than one in five, have some English ancestry, and about the same share, German.

Today, about half of all new immigrants are coming from Asia. The total U.S. population grew 11 percent during the 1970s, for example, while the Asian

Table 2. The Most Populous States, 1890 and 1990

	1890 Population in thousands		1990 Projected population in thousands	
1	New York	6,003	California	29,126
2	Pennsylvania	5,258	New York	17,773
3	Illinois	3,826	Texas	17,712
4	Ohio	3,672	Florida	12,818
5	Missouri	2,679	Pennsylvania	11,827
6	Massachusetts	2,239	Illinois	11,612
7	Texas	2,236	Ohio	10,791
8	Indiana	2,192	Michigan	9,293
9	Michigan	2,094	New Jersey	7,899
10	Iowa	1,912	North Carolina	6,690

Source: U.S. Bureau of the Census

American population grew 141 percent. The 1980 Census counted some 3.5 million Asian Americans. The 1990 Census is likely to count over 6.5 million.[9]

The 1980 Census also counted nearly 15 million Hispanics, about 6 percent of the total U.S. population. Providing consistent historical census information about America's Hispanic population is difficult because "prior to the 1970 Census, the concept of Hispanics as a group barely existed."[10] That census was the first to ask whether a person considered himself or herself Hispanic; earlier estimates were based on such concepts as surnames, foreign language spoken or country of birth. Hispanics have long been part of America, of course. In 1848, Mexico ceded to the United States the territory that is now Texas, New Mexico, Arizona, California, Nevada, Utah, and part of Colorado. Immigration as well as high birth rates among U.S. Hispanics has led to rapid growth of the Hispanic population. Recent projections show a Hispanic population of 21 million in 1990, 8 percent of the total U.S. population.[11]

The first census in 1790 counted 757,000 blacks, 92 percent of them in slavery. The black population was then about 19 percent of the total population. The 1980 Census counted 26.7 million blacks, under 12 percent of all Americans. Over 90 percent of all blacks lived in the South in 1790; by 1980 the proportion had dropped to just over half, but 1980 Census data also confirmed that more blacks are now moving into the South than out of the region.[12]

Census Bureau projections anticipate that by the time of the 1990 Census the black population will be over 31 million, or about 12.4 percent of the total U.S. population. The black population nationally is projected to grow some 16 percent. The black population of the West is projected to rise the fastest, increasing 29 percent between 1980 and 1990.[13]

Much of what the 1990 Census will reveal is already known—because the Census Bureau through its Current Population Survey provides reliable up-to-date statistics about many of America's population characteristics—but primarily at the national and regional levels. Only the census provides detailed and consistent statistics for small geographic areas nationwide.

Moreover, each census contains its share of surprises. For example, the 1980 Census counted 5.5 million more people than had been estimated and revealed that migration from the Northeast and Midwest to the South and West during the 1970s was much greater than had been thought. Estimates and projections can be inaccurate for many reasons; we need the census to set us straight. "The national census, taken once every ten years, is one of the most important signposts on the road from past to future. In its charting of the characteristics of the American people, each census is a mirror of society at a single point in history. Over the decades, the succession of censuses reveals the changing face of the American people."[14]

Taking the Census

Imagine having the job of taking the nation's first census in 1790: "Boundaries were ill defined so that the enumerator must often have been uncertain whether a family resided in his district or in an adjoining district . . . In many sections the danger from hostile Indians doubtless made travel unsafe for the enumerator," according to a Census Bureau publication in 1910.

> "One difficulty encountered in certain sections of the country was the unwillingness of the people to give the information required. Many persons had never before been enumerated. Some were superstitious regarding a census. An early colonial enumeration in New York had been followed by much sickness; and the people, recalling that a similar experience had befallen the children of Israel as the result of an enumeration made by King David, ascribed this sickness directly to the census. But a much more potent factor in arousing opposition to the enumeration was the belief that the census was in some way connected with taxation."[15]

Even after 200 years, in the era of the computer no less than the era of the quill pen, census takers still must persuade the skeptical, soothe the hostile, and expect the unexpected. Enumeration techniques have improved, because they have had to improve. The United States population has grown by over 6,000 percent in the past two centuries (see Table 3).

The objective of the census is ambitious—to locate each person and every living quarters in the United States, deliver a census questionnaire, and receive back the completed questionnaire. The government will print about 250 million census questionnaires and label and assemble over 100 million mailing pack-

Table 3. Growth of the Decennial Census, 1790 to 1990

Year	Total U.S. population (millions)	Number of enumerators	Total pages published reports	Cost per capita (cents)
1790	3.9	650	56	1.1
1800	5.3	900	74	1.2
1810	7.2	1,100	469	2.4
1820	9.6	1,188	288	2.1
1830	12.9	1,519	214	2.9
1840	17.1	2,167	1,465	4.8
1850	23.2	3,231	2,165	6.1
1860	31.4	4,417	3,189	6.3
1870	38.6	6,530	3,473	8.8
1880	50.2	31,382	21,458	11.4
1890	63.0	46,804	26,408	18.3
1900	76.2	52,871	10,925	15.5
1910	92.2	70,286	11,456	17.3
1920	106.0	87,234	14,550	23.7
1930	123.2	87,756	35,700	32.6
1940	132.2	123,069	58,400	51.1
1950	151.3	142,962	61,700	60.4
1960	179.3	159,321	103,000	71.4
1970	203.2	166,406	200,000	121.8
1980	226.5	n.a.[1]	300,000	486.0
1990 (projected)	249.9	n.a.[1]	500,000	1,040.4

[1] Data are not comparable to previous years due to mail-out mail-back census.

Source: Margo J. Anderson, *The American Census: A Social History* (New Haven, CT: Yale University Press, 1988) Table 2, Appendix, p. 242. © 1988 by Yale University Press; 1990 figures from Population Reference Bureau, Inc.

U.S. CENSUS
ENUMERATOR

U.S. Bureau of the Census

Although most census questionnaires are returned by mail, house calls by enumerators are still vital.

ages. At the peak of activity, 200,000 enumerators will be in the field visiting over 30 million households, and another 100,000 office workers will be supporting them. Seven million maps will help the enumerators find their way.

The Census Bureau will establish 449 temporary field district offices, each equipped with microcomputers, and another 35 district offices to help with promotion, recruitment, and data collection. There will also be a district office in Puerto Rico. The Bureau will open seven temporary computer-equipped processing offices, where specially designed equipment will scan microfilm copies of the millions of questionnaires and convert their responses to computer data.[16]

The 1990 Census will cost about $2.6 billion, more than twice as much as the previous census, which itself was the most expensive in history, even after accounting for inflation. It costs much more per capita to enumerate the final few percent of the population, some of whom do not want to be counted, than it does to count the great majority.

Congress first appropriated money for the 1990 Census in Fiscal Year 1984. The Census Bureau has conducted a series of tests in each year since then, covering representative geographic areas and a variety of proposed enumeration techniques. Testing began two years earlier in the decade than for the 1980 Census. The testing phase ended with a "dress rehearsal" in 1988, a full-scale minicensus in three locations replicating three types of settings the census expects to encounter—St. Louis, a hard-to-enumerate urban area; 14 counties in central Missouri containing small cities, suburbs, and rural areas; and eight counties typical of sparsely populated areas, plus two American Indian reservations in eastern Washington.

Census Day 1990

Now, the final preparations are underway for Census Day itself. On March 23, 1990, the U.S. Postal Service will deliver census questionnaires to about 88 million addresses, or 83 percent of all addresses in the country, primarily in metropolitan areas. Residents there will be asked to return their completed questionnaires by mail by April 1. A reminder card will be mailed on March 30 to improve the response rate.

For another 11 percent of the nation's housing units, mostly in rural and seasonal-housing areas in the South, Appalachia, and parts of the Midwest where addresses do not specify housing units precisely enough for mailing-list purposes, enumerators will visit every housing unit before Census Day, beginning in early March, and leave a census questionnaire to be filled out and returned by mail. In these areas the enumerators obtain the correct address at the time they drop off questionnaires; these housing units will also receive the mail reminder card on March 30th.

In sparsely populated parts of the country, where it is often difficult to determine mailing addresses and not cost-effective for enumerators to drop off questionnaires, the Postal Service will deliver unaddressed questionnaires to all known housing units. Members of these households are to complete the form and hold it for collection by enumerators, who record the addresses when they pick up the questionnaires. This technique will apply to only about 6 percent of all households but will cover 50 percent of the nation's land area.[17]

The Census Bureau's different methods are designed to enumerate easy-to-find households with as few personnel and as little cost as possible so that more resources can be deployed in those areas where it is more difficult to locate housing units and enumerate residents. The great majority of Americans will never talk to a census enumerator because they will receive and return their census forms by mail.

Taking the census by mail depends on having complete and accurate address lists. In areas where it can assign addresses to geographic codes by computer, the Census Bureau buys mailing lists from commercial list vendors and then checks the accuracy of these lists at several points before Census Day by canvassing neighborhoods and having the Postal Service compare lists with their records.

Obtaining a high mail-response rate is vital because the higher the response by mail, the fewer the enumerators needed. If the response rate is too low, more enumerators will be required than the Census Bureau may be able to afford to hire without weakening or cancelling other activities designed to improve census accuracy or reducing the number of publications of data.

In earlier decades, the government depended on many thousands of housewives to work as enumerators. Today, as census data have documented, a majority of wives have full-time work outside the home and it has become much harder to find people who will take temporary short-term jobs as enumerators. The Census Bureau's wages for enumerators generally are below what people who might qualify to serve as enumerators can earn in other jobs. The Bureau is experimenting with paying higher wages to enumerators in some areas to learn if it boosts productivity enough to justify the cost.

Although in the test censuses the mail-return rate was much lower than the Census Bureau expected, the mail-return rate in the dress rehearsal census in 1988 exceeded expectations. The improvements in operations and the publicity surrounding the dress rehearsal, in comparison with the test censuses, may have been responsible for the improved response rate. These same factors are likely also to improve the response rate for the census itself.[18]

Improving The Count

To strengthen public awareness of the 1990 Census, the Census Bureau will work with corporations, schools, religious and national minority organizations, and local governments and will mount an ambitious advertising and promotion campaign. The Advertising Council will continue to organize and run the campaign, as a public service. They will particularly seek to explain the census to blacks, Hispanics, and members of other minority groups who are relatively hard to enumerate.

To further improve the mail-return rate, the Bureau is also delivering census questionnaires to households five days earlier than in 1980 to give households more time to complete their responses. Persons who need help completing their questionnaire will be able to call a toll-free telephone number listed on the questionnaire. There will be toll-free numbers for assistance in Spanish and six Asian languages as well. In areas where there are language or other barriers, the Census Bureau will mail a brochure in several languages to each housing unit alerting people to the approach of the census questionnaire and urging them to fill it out and return it.

The census mailing package itself will also contain a message, because research conducted after the 1980 Census showed that the first time some people heard of the census was when the questionnaire arrived in the mail. Despite these exertions, Bureau planners expect the mail response rate in 1990 to fall below the 1980 rate by about five percentage points.[19]

From Census Day, April 1, 1990, until June of 1990, 200,000 enumerators will be contacting the housing units that did not return a questionnaire by mail. Census staff will telephone households and make up to three visits in person, if necessary, to find someone at home. Failing to find anyone after three visits, enumerators try to obtain information about the missing household residents by asking the neighbors, who often know at least the number of people living next door and usually know something (and sometimes a lot) about them.

In addition, the Census Bureau, through the Local Review Program, will give nearly 39,000 local government jurisdictions the opportunity to review preliminary counts from the 1990 Census in order to identify census blocks for which they can document discrepancies between the local records and census findings—areas in which more follow-up visits might be required. For the majority of Americans in most of the country, where the census questionnaire will be delivered and returned by mail, local officials also will be able to review the Census Bureau's counts of housing units, compiled from the address lists, for each block before the census questionnaires are mailed.

In some cases, census enumerators may not be able to learn anything about the inhabitants of a particular housing unit. If all else fails, but it is not clear that the housing unit in question should be identified as vacant, the Census Bureau has developed a computer program which assigns occupancy status (vacant or occupied) and people and characteristics to that household based on the responses obtained from the nearest similar housing unit. Testing has shown that these "imputation" procedures provide surprisingly accurate information—certainly better information than if all such housing units were simply, but incorrectly, identified as vacant. "The imputation procedure accounted for approximately 761,000 persons out of a final count of 226.5 million in the 1980 Census (0.34 percent of the total)."[20]

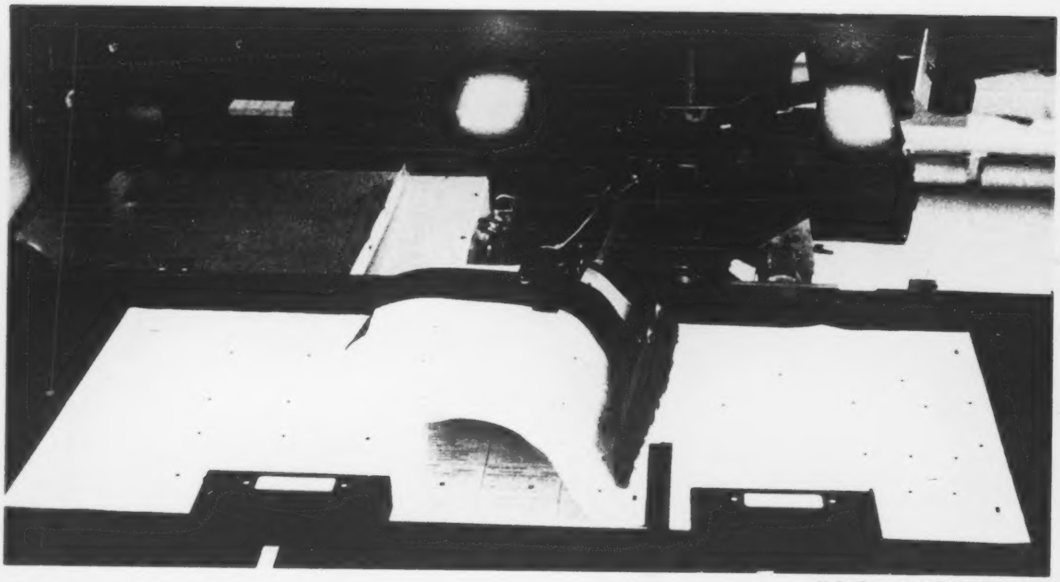
The census enumerates people at their usual place of residence (for those with a usual place). Census Day occurs in April because schools are in session, few of us are on vacation, so the odds are high that we can be reached at home, and most severe winter weather is over. Many Americans, nevertheless, are travelling or are in the middle of moving on Census Day. Regardless of where they may be on Census Day, the census tries to assign people to their usual residence as of April 1.

College students are included as residents of the place in which their college is located, if they are living there on April 1. But high school students in boarding schools are included at their parents' address. A "snowbird" couple living in a mobile home in Arizona on April 1, but also possessing a home in Minnesota, could be counted as residents of either place depending on the couple's own interpretation of what is their usual residence.

Not all Americans live in households. On Census Day millions will be living in military barracks, nursing homes, college dorms, prisons, or other types of group quarters. The Census Bureau enumerates residents of group quarters and tabulates some data for them separately from household residents, using individual census forms instead of the household questionnaires.

Counting the Homeless

Some people have no regular roof over their head at all. They are the homeless, migrants, and transients, and their numbers are thought to have grown dramatically since the previous census in 1980. The Census Bureau will conduct two op-



U.S. Bureau of the Census

The pages of a long-form census questionnaire are automatically turned during the microfilming process

erations specifically designed to locate selected components of the homeless and include them in the 1990 enumeration. These efforts will be prone to inaccuracies, but they are likely to produce better data than we have today about the number and characteristics of the homeless population.

A "shelter and street night" enumeration will take place on March 20-21, 1990, counting people in hotels and motels identified beforehand as shelters for the homeless or that cost $12 or less per night. It also includes "emergency shelters (public or private) and open locations in the streets, parks, and other areas not intended for habitation."[21]

In most cases, the enumeration will take place when people have settled for the night. For shelters, it is scheduled between 6 p.m. and midnight on March 20. Street enumeration will be between 2 a.m. and 4 a.m. on March 21. Then, between 4 a.m. and 6:30 a.m., enumerators will be stationed outside previously identified "abandoned-looking and boarded-up buildings to enumerate anyone who comes out and to ask about others in the building."[22] Who will tackle such difficult assignments? The Census Bureau plans to encourage those who work with the homeless, and the homeless themselves, to apply.

Processing

Even before field operations conclude, the Census Bureau will begin processing the questionnaires it receives from the nation's 106 million housing units. Each questionnaire is checked in at a census office, where high-speed laser sorters or bar-code scanners will read the questionnaire's identification number. This process allows the Bureau to assemble lists of addresses for each enumeration area from which questionnaires were not returned for enumerator follow up.[23]

Each questionnaire will be examined for completeness and internal consistency. Computer and clerical editing programs have been designed to uncover inaccuracies. For example, a household that fails to report the ages of any of its members must be contacted by an enumerator, usually by telephone.

When a questionnaire is deemed complete, it is microfilmed by a high-speed camera, and the film is put through

FOSDIC (Film Optical Scanning Device for Input to Computers), a system that transfers the responses to each item on the questionnaire onto computer tape. FOSDIC only recognizes the marks in the response circles of the questionnaire. Handwritten answers are either keyed or manually coded and entered into the computer system. FOSDIC cannot interpret the names on the questionnaire nor the address from which the questionnaire came. The only identification in the computer is a geographic code that links the data from each questionnaire with its correct census block.

When the data have been completely tabulated, the Census Bureau destroys the paper questionnaires. The microfilm is stored under guard at the Personal Census Service Branch in Pittsburg, Kansas. This service helps many individuals every year to obtain information about themselves from previous censuses to use as a substitute for a birth certificate, qualification for Social Security, and similar purposes. Only the respondent or his or her legal representative can obtain access to the information.[24] A copy is also given to the National Archives, which grants access to researchers after 72 years.

U.S. Bureau of the Census

FOSDIC feeds census questionnaire data into computers.

The Census Questionnaire

Like any survey, large or small, a census is only as good as the information it collects from respondents. This is not as simple as it may seem. The wording of a question affects responses to it. The length and appearance of the questionnaire can either invite or discourage public cooperation. Questions cannot be intrusive, offensive, or widely controversial, and they must be formulated in a clear, concise manner that a wide variety of people can understand and that will yield accurate data.

The census includes a short-form questionnaire that approximately five out of every six households in the nation will receive. It asks 14 questions, of which 7 apply to every person and 6 concern housing conditions. One question is asked to learn if each household member was counted or if visitors were mistakenly included who should be enumerated as part of another household elsewhere. Some are in two parts.

A random sample of approximately one-in-six households receives a long form of the questionnaire that asks these and an additional 19 questions about housing conditions and 26 questions about individuals. Several of these questions have multiple parts, but not everyone will answer every question because some apply only to households or persons with certain characteristics.

The census short-form asks for such basic information as age, sex, and race. The long form goes into more detail, for example whether a person holds a Ph.D., served in the military during the Vietnam era, or has a disability. Inquiries about housing range from the short-form question about the number of rooms a dwelling contains to the long-form question about whether a householder uses solar energy as the principal heating source.

The planners of the 1990 Census wish to provide data that are comparable to data collected in previous decades in order to build reliable and consistent series of statistics. If the questions are changed from one decade to the next, it interrupts these series. There is strong pressure for questions not to be dropped from the census. Many sectors of the economy have come to rely on data from specific questions and their deletion might cause disruption of important activities. Highest priority goes to questions providing data to meet the requirements of federal laws or government programs.

There is also great pressure to add new questions. In the 1980 Census, for example, a question on disability appeared for the first time. In 1990, this question is being expanded because of the growing interest in this subject, an interest sparked in part by the information about the disabled provided by the 1980 Census. A question on second mortgage payments is also being asked for the first time to reflect the rising popularity of home equity loans.

A competing concern, however, is not to burden the public by asking too many questions. Those planning the 1990 Census required that the length of the 1990 questionnaire be no longer than the 1980 version and that the total amount of time spent by people filling out the census questionnaire not increase. As new questions are added, therefore, others must be dropped. A question that appeared in the 1980 Census about the presence of air conditioning will not appear in 1990, nor will a question on marital history because space on the questionnaire was limited and the federal constituency for these questions was relatively weak.

The White House, through the Office of Management and Budget (OMB), must approve the content and wording of the census questionnaire. Within OMB, the Office of Information and Regulatory Affairs (OIRA) is watchdog over the "paperwork burden" imposed by government. Under the national Paperwork Reduction Act, federal agencies that propose to collect information from the public must first demonstrate to OMB the value of the information and the public needs to which it responds.[25]

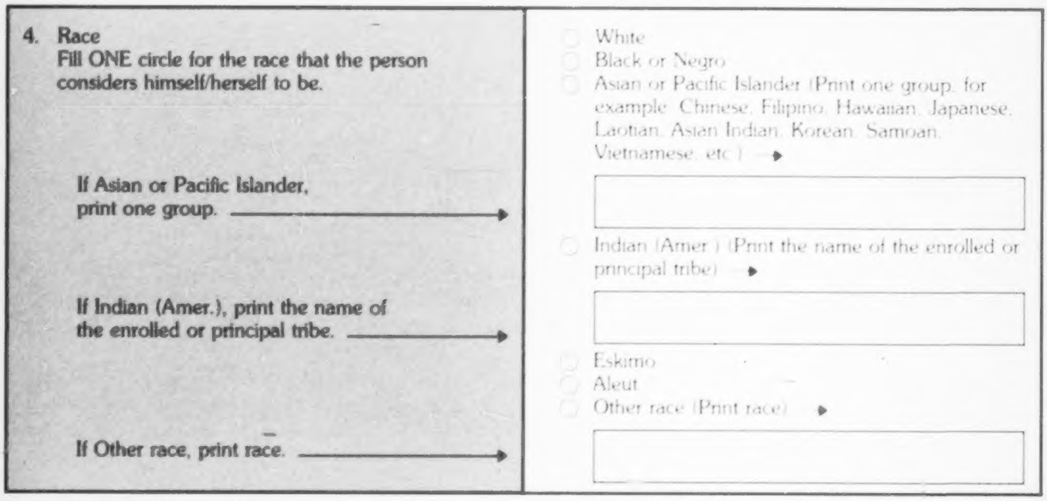
To justify the inclusion of each question, OMB requires the Census Bureau to document all of the hundreds of uses the federal government makes of the answers that are either specified by law or required by federal agencies to carry out programs mandated by law. The justifications, which cover some 150 legal-sized pages, are a fascinating look at just how widespread our reliance on census statistics has become.

The government needs to know how old we are, among many other reasons, because the Older Americans Act of 1965 requires age data at the state level to plan community programs for the elderly. The Urban Mass Transportation Administration uses statistics about disability at the state, county, and city levels to improve public transit services for the handicapped. Another law specifies that the Job Training Partnership Act will use decennial census data on income and poverty to make decisions about funding training programs.

Many agencies use census data on race to ensure that laws forbidding racial discrimination are being met. The race data also serve other purposes, such as the Indian Sanitation Facilities Act, under which the Public Health Service improves the plumbing on reservations.

The Census Bureau also requests and receives a multitude of opinions about questionnaire content from many sectors of the American public. Beginning in April 1984, the Bureau held 65 public meetings throughout the country to present its plans about the subject content of the census for public reaction. More than 5,000 people attended these meetings. Advice also came from the official advisory committees to the census, several special conferences, and meetings with various professional associations. To determine federal government data needs, the Census Bureau sought counsel from agencies through 10 interagency working groups and through OMB's Federal Agency Council on the 1990 Census.

Figure 2. Initial Proposal for New Race Question, 1990 Census



4. Race
Fill ONE circle for the race that the person considers himself/herself to be.

If Asian or Pacific Islander, print one group. →

If Indian (Amer.), print the name of the enrolled or principal tribe. →

If Other race, print race. →

○ White
○ Black or Negro
○ Asian or Pacific Islander (Print one group, for example: Chinese, Filipino, Hawaiian, Japanese, Laotian, Asian Indian, Korean, Samoan, Vietnamese, etc.) →

○ Indian (Amer.) (Print the name of the enrolled or principal tribe) →

○ Eskimo
○ Aleut
○ Other race (Print race) →

Source: U.S. Bureau of the Census

Another important step in determining the shape of the 1990 Census questionnaire was the National Content Test. Designed explicitly to test new or revised wording, format, and the sequence of questions, the test covered a sample of nearly 50,000 representative households throughout the country in March 1986.

Following this extensive advice, public consultation, and testing, the Census Bureau submitted the topics planned for inclusion in the 1990 Census to Congress in March 1987, and supplied Congress with the specific questions for the 1990 questionnaire before the legal deadline of April 1, 1988.[26]

Figure 2 (above) shows an Administration proposal for a new race question. After seeing this proposal, however, Congress passed a law that specified different wording because several Members of Congress representing Asian Americans were unhappy that the Census Bureau no longer planned to include check-off response boxes for specifically-named, selected Asian or Pacific Islander races as it had in 1980. The Bureau said testing showed that the version above would produce more accurate results, but Asian American groups feared a loss of identity.

President Reagan vetoed this bill in November of 1988, and voiced his support for the version proposed by the Census Bureau. Before the veto, however, not wishing to alienate the bill's Congressional sponsors nor Asian Americans, the Census Bureau agreed to use the Congressional version in 1990.

Thus, for a time the Census Bureau found itself in the awkward position of having compromised with Congress to use a census question it had publicly opposed and which the President had denounced. This issue was finally resolved when the Reagan Administration agreed to support the Census Bureau compromise. The 1990 Census questionnaire will employ check-off boxes for Asian and Pacific Islander groups as in 1980 and will include a new write-in box for "other."

The complete final 1990 Census Questionnaire with annotations follows on pages 18 to 24 (Figure 3).

Figure 3. The 1990 Census Questionnaire, Annotated

The questionnaire shown in this article is a pre production advance copy provided by the Census Bureau Annotations are by the American Demographics *staff*

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1 (Not shown here) As in 1980 the question asks for the names of the household members Census information is strictly confidential The Census Bureau uses this question only to ensure that each person is counted just once

2 Provides information on household type (married couple single parent family single person household etc) and the number of persons in the household The Census Bureau changed this question in 1980 replacing the concept of household "head" with that of householder—the person in whose name the dwelling unit is owned or rented The 1990 data will be comparable with data for 1980 but not exactly comparable with 1970 data

As in 1980, there are spaces on the census form for information on up to seven household members We show column one here All the columns are identical to column one except for question 2, which asks for the other household members' relationship with the person listed in column one If the member is a relative, then the household is a family The family categories include husband wife natural-born or adopted son daughter, stepson stepdaughter, brother sister father/mother, grandchild, and other relative (with space to write in the relationship) If the people in columns two through seven are not relatives, then the catagories include roomer, boarder or foster child, housemate or roommate, unmarried partner, and other nonrelative

The 1990 census includes two new catagories on the relationship list—stepson stepdaughter, and grandchild These will allow researchers to estimate "blended families" The partner roommate category of 1980 is separated into two categories in 1990—roommate and unmarried partner Now researchers will be able to count the number of cohabitating couples

3 Same as in 1980

4 Similar to the 1980 question The same nine Asian Pacific Islander ethnic groups listed on the 1980 census also appear on the 1990 census, with the addition of a space for those from other Asian Pacific Islander groups to write in their group

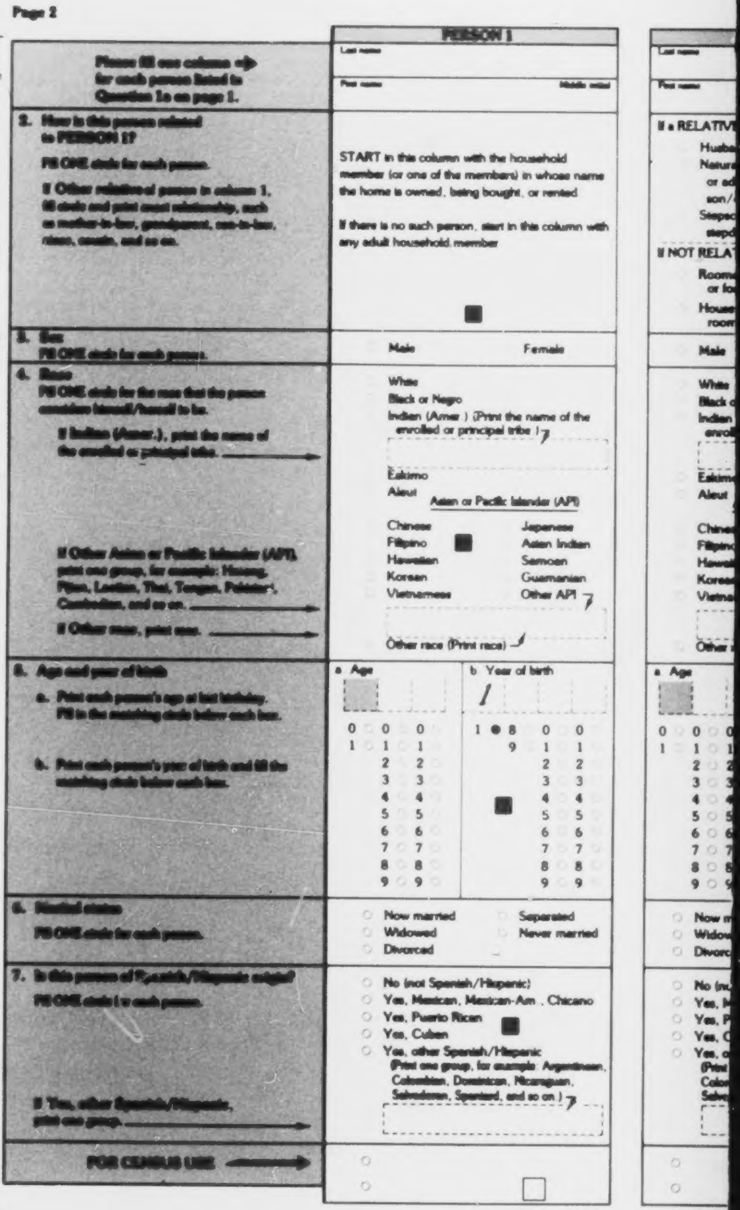
5 Similar to the 1980 question This question provides information on age and year of birth but no longer asks for the month

6 Same as in 1980 But the sample question on marital history has been deleted from the 1990 census In 1990, respondents will not be asked if they have been married before and if that marriage ended because of the death of a spouse

7 Similar to the 1980 question The major ethnic groups—Mexican, Puerto Rican, and Cuban—are listed In 1990, a space is provided for respondents from other Hispanic ethnic groups to specify their background such as Colombian or Dominican In 1980, respondents had to check "other," and could not specify the ethnic group The new format will provide those targeting the Hispanic market with richer detail on the diversity of their consumers

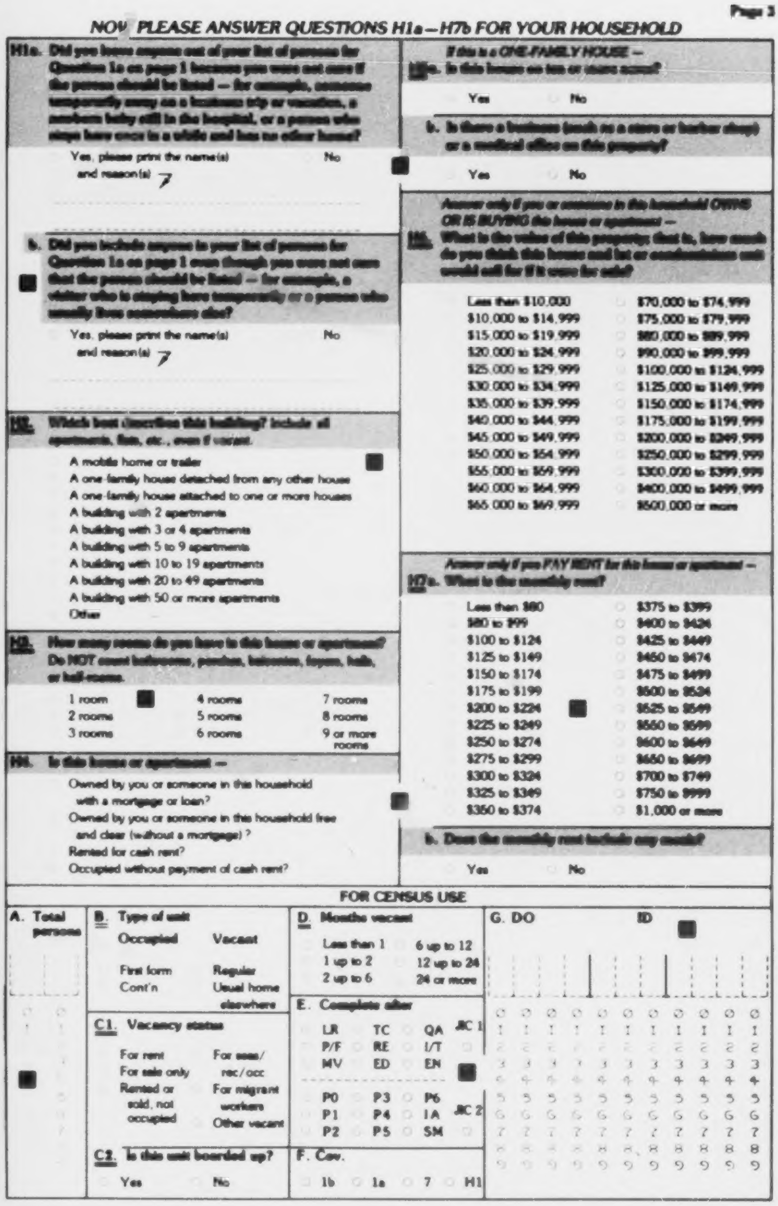
H1 Similar to the 1980 question, but reworded

The short-form consists of these two pages The long-form combines these and the following pages



Page 2

	PERSON 1
Please fill one column for each person listed in Question 1a on page 1.	Last name First name Middle initial
2. How is this person related to PERSON 1? **Fill ONE circle for each person.** **If Other relative of person in column 1, fill circle and print exact relationship, such as mother-in-law, grandparent, son-in-law, niece, cousin, and so on.**	START in this column with the household member (or one of the members) in whose name the home is owned, being bought, or rented If there is no such person, start in this column with any adult household member
3. Sex **Fill ONE circle for each person.**	Male Female
4. Race **Fill ONE circle for the race that the person considers himself/herself to be.** **If Indian (Amer.), print the name of the enrolled or principal tribe.** → **If Other Asian or Pacific Islander (API), print one group, for example: Hmong, Fijian, Laotian, Thai, Tongan, Pakistani, Cambodian, and so on.** → **If Other race, print race.** →	White Black or Negro Indian (Amer) (Print the name of the enrolled or principal tribe) Eskimo Aleut Asian or Pacific Islander (API) Chinese Japanese Filipino Asian Indian Hawaiian Samoan Korean Guamanian Vietnamese Other API Other race (Print race)
5. Age and year of birth **a. Print each person's age at last birthday. Fill in the matching circle below each box.** **b. Print each person's year of birth and fill the matching circle below each box.**	a Age 0 ○ 0 ○ 0 ○ 1 ○ 1 ○ 1 ○ 2 ○ 2 ○ 3 ○ 3 ○ 4 ○ 4 ○ 5 ○ 5 ○ 6 ○ 6 ○ 7 ○ 7 ○ 8 ○ 8 ○ 9 ○ 9 ○ b Year of birth 1 ● 8 ○ 0 ○ 0 ○ 9 ○ 1 ○ 1 ○ 2 ○ 2 ○ 3 ○ 3 ○ 4 ○ 4 ○ 5 ○ 5 ○ 6 ○ 6 ○ 7 ○ 7 ○ 8 ○ 8 ○ 9 ○ 9 ○
6. Marital status **Fill ONE circle for each person.**	○ Now married ○ Separated ○ Widowed ○ Never married ○ Divorced
7. Is this person of Spanish/Hispanic origin? **Fill ONE circle for each person.** **If Yes, other Spanish/Hispanic, print one group.** →	○ No (not Spanish/Hispanic) ○ Yes, Mexican, Mexican-Am , Chicano ○ Yes, Puerto Rican ○ Yes, Cuban ○ Yes, other Spanish/Hispanic (Print one group, for example: Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on)
FOR CENSUS USE →	○ ○ ☐



Page 3

NOW PLEASE ANSWER QUESTIONS H1a—H7b FOR YOUR HOUSEHOLD

H1a. Did you leave anyone out of your list of persons for Question 1a on page 1 because you were not sure if the person should be listed — for example, someone temporarily away on a business trip or vacation, a newborn baby still in the hospital, or a person who stays here once in a while and has no other home?

○ Yes, please print the name(s) and reason(s) ↗ ○ No

b. Did you include anyone in your list of persons for Question 1a on page 1 even though you were not sure that the person should be listed — for example, a visitor who is staying here temporarily or a person who usually lives somewhere else?

○ Yes, please print the name(s) and reason(s) ↗ ○ No

H2. Which best describes this building? Include all apartments, flats, etc., even if vacant.

- ○ A mobile home or trailer
- ○ A one-family house detached from any other house
- ○ A one-family house attached to one or more houses
- ○ A building with 2 apartments
- ○ A building with 3 or 4 apartments
- ○ A building with 5 to 9 apartments
- ○ A building with 10 to 19 apartments
- ○ A building with 20 to 49 apartments
- ○ A building with 50 or more apartments
- ○ Other

H3. How many rooms do you have in this house or apartment? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- ○ 1 room
- ○ 2 rooms
- ○ 3 rooms
- ○ 4 rooms
- ○ 5 rooms
- ○ 6 rooms
- ○ 7 rooms
- ○ 8 rooms
- ○ 9 or more rooms

H4. Is this house or apartment —

- ○ Owned by you or someone in this household with a mortgage or loan?
- ○ Owned by you or someone in this household free and clear (without a mortgage)?
- ○ Rented for cash rent?
- ○ Occupied without payment of cash rent?

If this is a ONE-FAMILY HOUSE —

H5a. Is this house on ten or more acres?

○ Yes ○ No

b. Is there a business (such as a store or barber shop) or a medical office on this property?

○ Yes ○ No

Answer only if you or someone in this household OWNS OR IS BUYING this house or apartment —

H6. What is the value of this property; that is, how much do you think this house and lot or condominium unit would sell for if it were for sale?

- ○ Less than $10,000
- ○ $10,000 to $14,999
- ○ $15,000 to $19,999
- ○ $20,000 to $24,999
- ○ $25,000 to $29,999
- ○ $30,000 to $34,999
- ○ $35,000 to $39,999
- ○ $40,000 to $44,999
- ○ $45,000 to $49,999
- ○ $50,000 to $54,999
- ○ $55,000 to $59,999
- ○ $60,000 to $64,999
- ○ $65,000 to $69,999
- ○ $70,000 to $74,999
- ○ $75,000 to $79,999
- ○ $80,000 to $89,999
- ○ $90,000 to $99,999
- ○ $100,000 to $124,999
- ○ $125,000 to $149,999
- ○ $150,000 to $174,999
- ○ $175,000 to $199,999
- ○ $200,000 to $249,999
- ○ $250,000 to $299,999
- ○ $300,000 to $399,999
- ○ $400,000 to $499,999
- ○ $500,000 or more

Answer only if you PAY RENT for this house or apartment —

H7a. What is the monthly rent?

- ○ Less than $80
- ○ $80 to $99
- ○ $100 to $124
- ○ $125 to $149
- ○ $150 to $174
- ○ $175 to $199
- ○ $200 to $224
- ○ $225 to $249
- ○ $250 to $274
- ○ $275 to $299
- ○ $300 to $324
- ○ $325 to $349
- ○ $350 to $374
- ○ $375 to $399
- ○ $400 to $424
- ○ $425 to $449
- ○ $450 to $474
- ○ $475 to $499
- ○ $500 to $524
- ○ $525 to $549
- ○ $550 to $599
- ○ $600 to $649
- ○ $650 to $699
- ○ $700 to $749
- ○ $750 to $999
- ○ $1,000 or more

b. Does the monthly rent include any meals?

○ Yes ○ No

FOR CENSUS USE

A. Total persons

○ 0 ○ 0
1 1 2 3 4 5 6 7 8 9

B. Type of unit

Occupied	Vacant
○ First form	○ Regular
○ Cont'n	○ Usual home elsewhere

C1. Vacancy status

○ For rent	○ For seas/rec/occ
○ For sale only	○ For migrant workers
○ Rented or sold, not occupied	○ Other vacant

C2. Is this unit boarded up?

○ Yes ○ No

D. Months vacant

○ Less than 1	○ 6 up to 12
○ 1 up to 2	○ 12 up to 24
○ 2 up to 6	○ 24 or more

E. Complete after

○ LR	○ TC	○ QA	JIC 1
○ P/F	○ RE	○ I/T	○
○ MV	○ ED	○ EN	
○ P0	○ P3	○ P6	JIC 2
○ P1	○ P4	○ IA	○
○ P2	○ P5	○ SM	

F. Cov.

○ 1b ○ 1a ○ 7 ○ H1

G. DO ID

0 0 0 0 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1 1 1 1
2 2 2 2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3 3 3 3
4 4 4 4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5 5 5 5
6 6 6 6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9 9 9 9

H2 Similar to the 1980 question, this question asks Americans to describe their dwelling unit. As in 1980, the categories include mobile homes and trailers, as well as apartments and single family houses. Unlike in 1980, "boat, tent, van, etc." is not included as a category. This change could obscure data on homeless people who live in vehicles or other makeshift shelters. But the bureau plans to count the homeless and "precariously housed" in a special nighttime enumeration on March 20. The bureau plans to make these data available for other agencies to analyze.

Several housing questions related to building conditions have been dropped from the 1990 census, such as the number of dwelling units at a single address, whether the entrance to the living quarters is shared, the number of stories in the building, and the presence of an elevator.

H3 Same as in 1980.

H4 Expanded. Home ownership "free and clear" is listed separately from ownership with a mortgage or loan. These two choices were combined in 1980.

H5 Similar to the 1980 question, but slightly reworded. This question separates farmhouses, estates, and partially commercial structures from single family dwellings. These structures will not be included in the tabulation of the value of single family housing.

H6 Similar to the 1980 question. Asks homeowners to place a dollar value on their dwelling unit. The top end in 1980 was $200,000 and over; now it is $500,000 and above.

H7a Expands the categories for monthly rent. The top end in 1980 was $500 or more; now it is $1,000 or more. The lower limit is now less than $100; in 1980 it was less than $50.

H7b New question. Asks if meals are included in rent. This will gather information on special housing for the elderly. This question is the last one on the short form. The remaining questions appear only on the long census questionnaire that goes to a sample of households.

H8 Similar to the 1980 question. Asks when the person listed in column one moved into the dwelling. Categories have been revised to include detail on the 1980s and exclude detail before 1959. The category "always lived here" has been dropped. In 1970, a similar question was asked of each member of the household.

Figure 3. The 1990 Census Questionnaire, Annotated (cont.)

H9 Similar to the 1980 question, but reworded. This question provides information on the number of bedrooms in the dwelling. But the question on the number of bathrooms in the dwelling—a good indicator of housing value—is gone.

H10 Similar to the 1980 question. Asks if the dwelling unit has complete plumbing facilities but no longer asks if it has only some facilities or if the respondent shares plumbing facilities with another household. This question was first included in the 1970 census as a measure of housing quality. In 1980, it was part of the complete count.

H11 Similar to the 1980 question, but reworded.

H12 Similar to the 1980 question, but reworded.

H13 Similar to the 1980 question, but trucks and vans are no longer separated from automobiles. The question includes separate categories for up to seven or more vehicles. In 1980, categories ended with three or more vehicles.

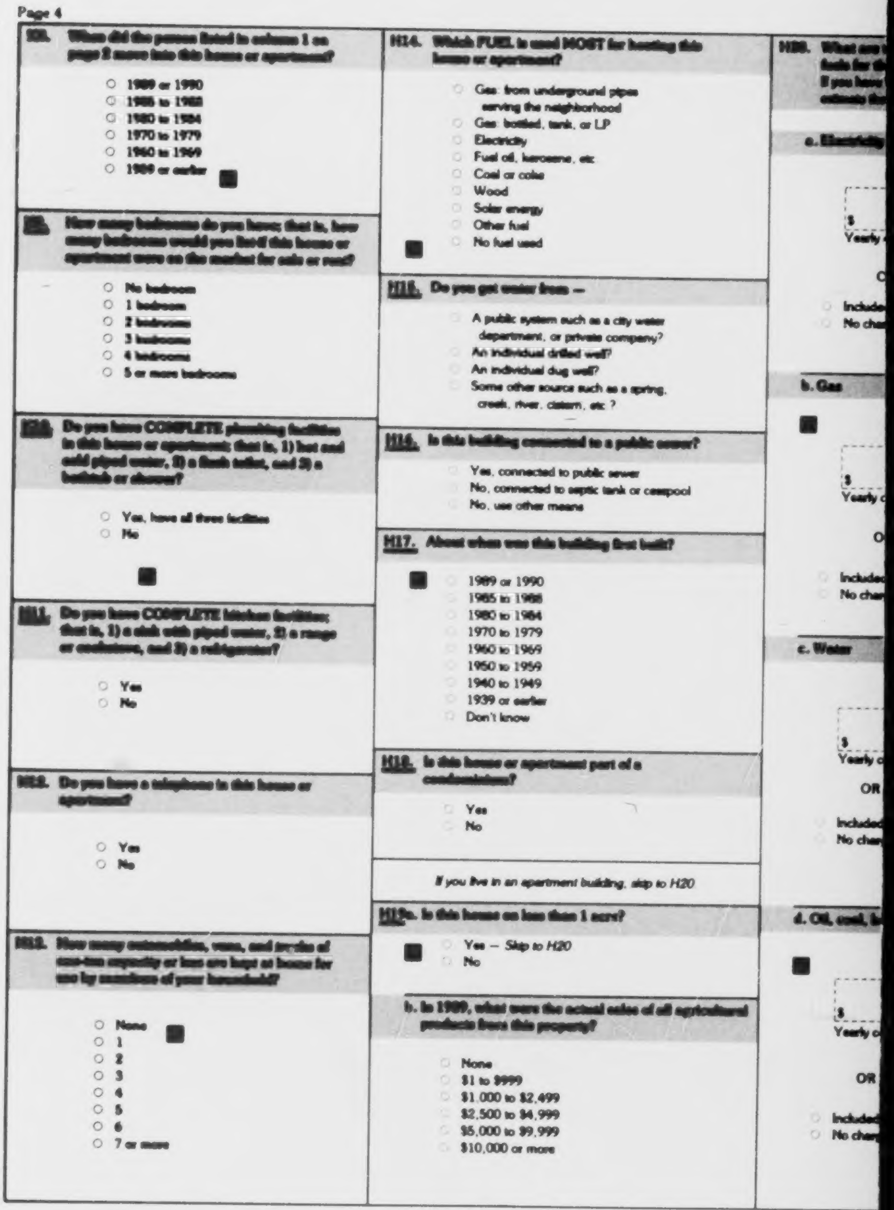
H14 Changed to reflect the current energy outlook. The question on the main fuel that heats the dwelling has been expanded to include solar energy. But the census no longer asks how the living quarters are heated (steam or water, central warm-air, etc.). Questions on the types of fuels used for water heating and cooking have also been eliminated. The question on air conditioning is gone. The 1980 census included this kind of detail because of the energy crisis of the 1970s.

H15 Same as in 1980.

H16 Same as in 1980.

H17 Similar to the 1980 question. Asks when the dwelling was built. It has been updated to include 1980s. The earliest date remains 1939
or earlier.

H18 Similar to the 1980 question, but reworded. This question was included in the complete count in 1980.



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H8. When did the person listed in column 1 on page 2 move into this house or apartment?

○ 1989 or 1990
○ 1985 to 1988
○ 1980 to 1984
○ 1970 to 1979
○ 1960 to 1969
○ 1959 or earlier

H9. How many bedrooms do you have; that is, how many bedrooms would you list if this house or apartment were on the market for sale or rent?

○ No bedroom
○ 1 bedroom
○ 2 bedrooms
○ 3 bedrooms
○ 4 bedrooms
○ 5 or more bedrooms

H10. Do you have COMPLETE plumbing facilities in this house or apartment; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

○ Yes, have all three facilities
○ No

H11. Do you have COMPLETE kitchen facilities; that is, 1) a sink with piped water, 2) a range or cookstove, and 3) a refrigerator?

○ Yes
○ No

H12. Do you have a telephone in this house or apartment?

○ Yes
○ No

H13. How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

○ None
○ 1
○ 2
○ 3
○ 4
○ 5
○ 6
○ 7 or more

H14. Which FUEL is used MOST for heating this house or apartment?

○ Gas: from underground pipes serving the neighborhood
○ Gas: bottled, tank, or LP
○ Electricity
○ Fuel oil, kerosene, etc.
○ Coal or coke
○ Wood
○ Solar energy
○ Other fuel
○ No fuel used

H15. Do you get water from —

○ A public system such as a city water department, or private company?
○ An individual drilled well?
○ An individual dug well?
○ Some other source such as a spring, creek, river, cistern, etc.?

H16. Is this building connected to a public sewer?

○ Yes, connected to public sewer
○ No, connected to septic tank or cesspool
○ No, use other means

H17. About when was this building first built?

○ 1989 or 1990
○ 1985 to 1988
○ 1980 to 1984
○ 1970 to 1979
○ 1960 to 1969
○ 1950 to 1959
○ 1940 to 1949
○ 1939 or earlier
○ Don't know

H18. Is this house or apartment part of a condominium?

○ Yes
○ No

If you live in an apartment building, skip to H20

H19a. Is this house on less than 1 acre?

○ Yes — *Skip to H20*
○ No

b. In 1989, what were the actual sales of all agricultural products from this property?

○ None
○ $1 to $999
○ $1,000 to $2,499
○ $2,500 to $4,999
○ $5,000 to $9,999
○ $10,000 or more

**H20. What are t
fuels for th
If you have
estimate th**

a. Electricity

$
Yearly

O

○ Include
○ No cha

b. Gas

$
Yearly c

O

○ Included
○ No char

c. Water

$
Yearly c

OR

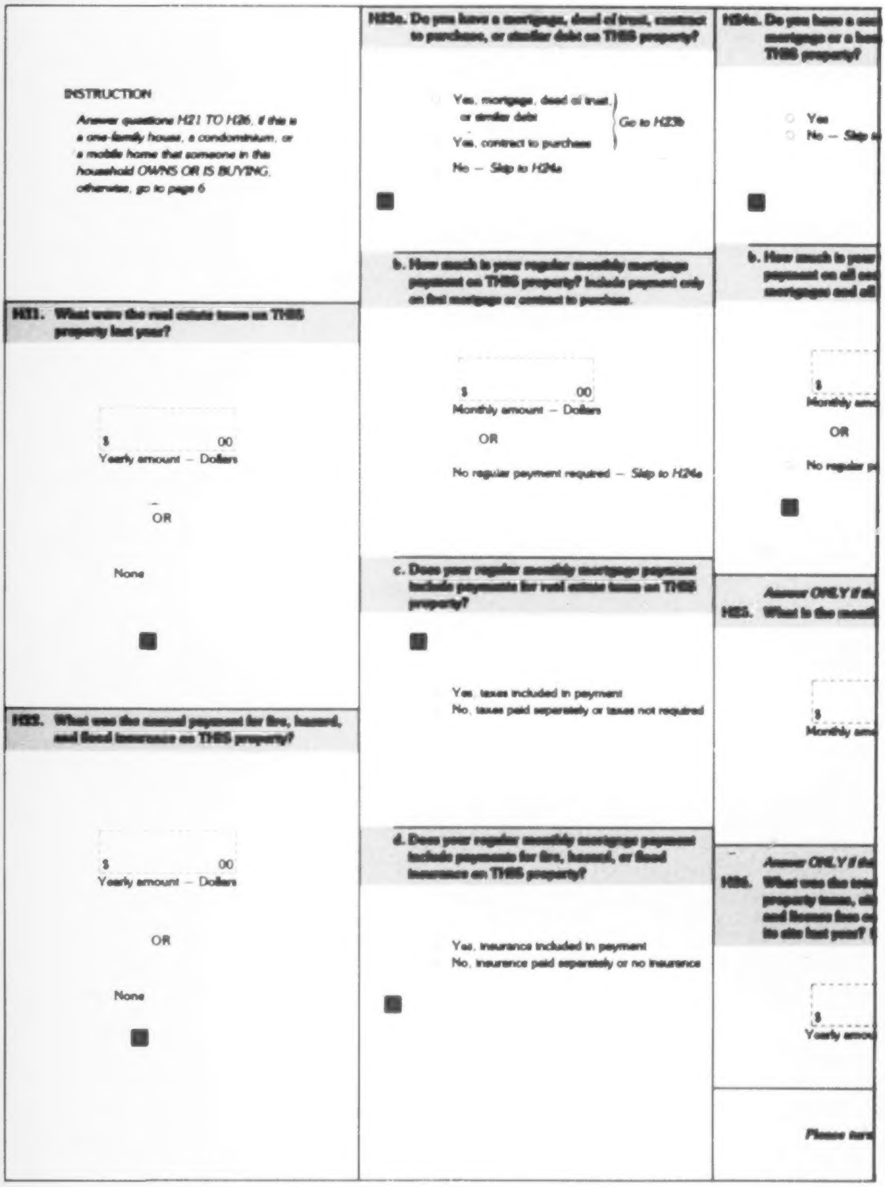
○ Included
○ No char

d. Oil, coal, k

$
Yearly c

OR

○ Included
○ No char



INSTRUCTION

Answer questions H21 TO H26, if this is a one-family house, a condominium, or a mobile home that someone in this household OWNS OR IS BUYING; otherwise, go to page 6

H21. What were the real estate taxes on THIS property last year?

$ 00
Yearly amount — Dollars

OR

None

H22. What was the annual payment for fire, hazard, and flood insurance on THIS property?

$ 00
Yearly amount — Dollars

OR

None

H23a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

Yes, mortgage, deed of trust, or similar debt } *Go to H23b*
Yes, contract to purchase } *Go to H23b*
No — *Skip to H24a*

b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.

$ 00
Monthly amount — Dollars

OR

No regular payment required — *Skip to H24a*

c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

Yes, taxes included in payment
No, taxes paid separately or taxes not required

d. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

Yes, insurance included in payment
No, insurance paid separately or no insurance

H24a. Do you have a sec
mortgage or a h
THIS property?

○ Yes
○ No — *Skip*

b. How much is your
payment on all sec
mortgages and all

$
Monthly amo

OR

No regular p

Answer ONLY if th
H25. What is the mont

$
Monthly amo

Answer ONLY if th
H26. What was the tota
property taxes, sit
and license fees o
its site last year?

$
Yearly amou

Please turn

H19a Similar to the 1980 question. No longer asks repondents to differentiate between buildings on one to nine acres and those on ten acres or more.

H19b Expands the categories for sale of agricultural goods from the property. The top end in 1980 was $2,500; now it is $10,000 or more.

H20 Similar to the 1980 question. The 1990 question asks for annual costs; the 1980 question asked for average monthly costs.

H21 Same as in 1980.

H22 Similar to the 1980 question. Expanded to include flood insurance payments.

H23a Same as in 1980.

H23b Similar to the 1980 question, except the instructions ask the respondent to include only the payment on the first mortgage or contract to purchase. In 1980, respondents were asked to include second or junior mortgage payments here.

H23c Same as in 1980.

H23d Similar to the 1980 question. Expanded to include flood-insurance payments.

H24a Revised to include home-equity loans. In 1980, only second or junior mortgages were asked about.

H24b New question. Asks for regular monthly payment on second or junior mortgage or home-equity loan. Respondents in 1980 were asked if they had a second or junior mortgage, but they were not asked to list the amount of this payment separately.

H25 New question. Asks for monthly condominium fee.

H26 New question. Asks for monthly mobile-home fees, including personal property taxes, site rent, and registration and license fees, but excluding real estate taxes.

Figure 3. The 1990 Census Questionnaire, Annotated (cont.)

8 Similar to the 1980 question, but reworded

9 More detailed than in 1980. Citizens born in the 50 states and the District of Columbia are now coded separately from citizens born in Puerto Rico, Guam, the U.S. Virgin Islands, and Northern Mariana

10 Similar to the 1980 question. Categories have been expanded to include the 1980s. The earliest date remains before 1950

11 Similar to the 1980 question. No longer asks if the person attended a church related school

12 No longer asks for the highest grade attended, but asks for the highest grade completed. Also asks respondents to specify the highest degree they have earned rather than the number of years they attended college. This will make education statistics more meaningful, but they won't be exactly comparable with those from earlier censuses

13 Similar to the 1980 question, but reworded

14 Similar to the 1980 question, but reworded

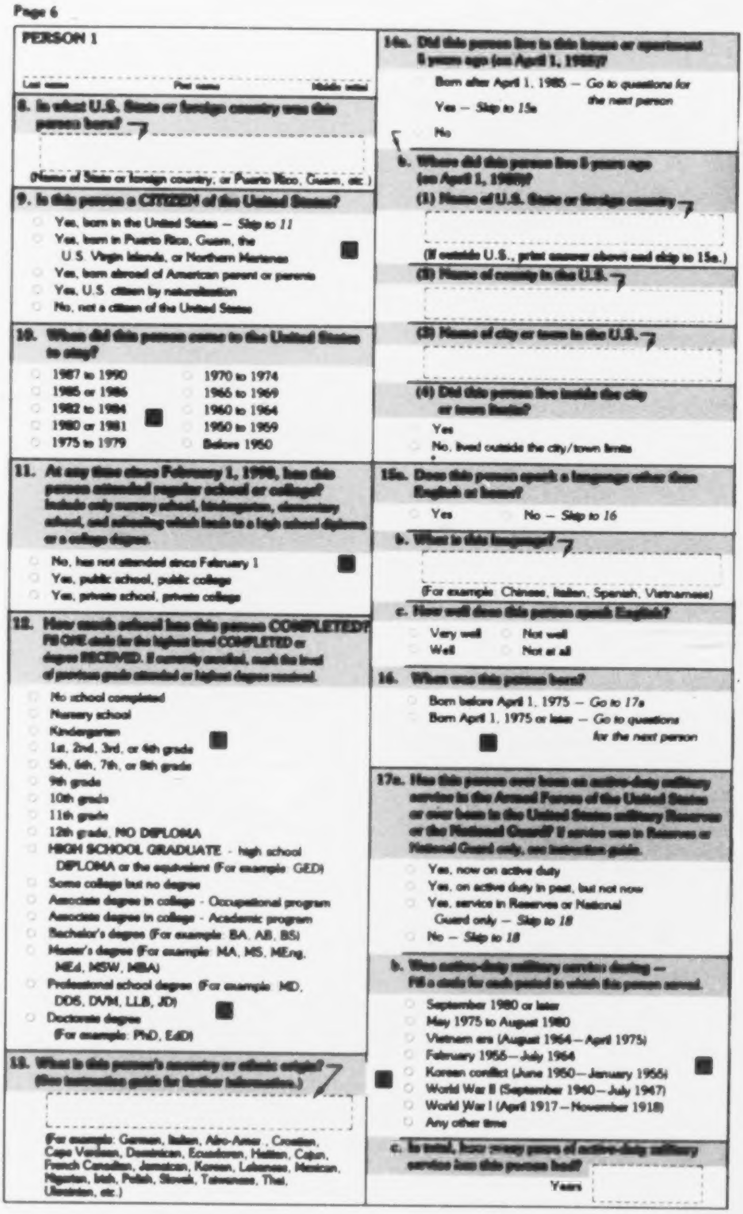
15 Same as in 1980

16 Same as in 1980

17a In 1980, respondents were asked if they were veterans of active duty military services. In 1990, a category for reserves or National Guard has been added. But the question that asked whether the respondent was in the armed forces, college, or the work force five years earlier is gone

17b Similar to the 1980 question, but categories have been updated

17c New question. Asks for total number of years of active-duty military service



Page 6

PERSON 1

Last name First name Middle initial

8. In what U.S. State or foreign country was this person born?

(Name of State or foreign country, or Puerto Rico, Guam, etc.)

9. Is this person a CITIZEN of the United States?

○ Yes, born in the United States — *Skip to 11*
○ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
○ Yes, born abroad of American parent or parents
○ Yes, U.S. citizen by naturalization
○ No, not a citizen of the United States

10. When did this person come to the United States to stay?

○ 1987 to 1990	○ 1970 to 1974
○ 1985 or 1986	○ 1965 to 1969
○ 1982 to 1984	○ 1960 to 1964
○ 1980 or 1981	○ 1950 to 1959
○ 1975 to 1979	○ Before 1950

11. At any time since February 1, 1990, has this person attended regular school or college? Include only nursery school, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

○ No, has not attended since February 1
○ Yes, public school, public college
○ Yes, private school, private college

12. How much school has this person COMPLETED? Fill ONE circle for the highest level COMPLETED or degree RECEIVED. If currently enrolled, mark the level of previous grade attended or highest degree received.

○ No school completed
○ Nursery school
○ Kindergarten
○ 1st, 2nd, 3rd, or 4th grade
○ 5th, 6th, 7th, or 8th grade
○ 9th grade
○ 10th grade
○ 11th grade
○ 12th grade, NO DIPLOMA
○ HIGH SCHOOL GRADUATE - high school DIPLOMA or the equivalent (For example: GED)
○ Some college but no degree
○ Associate degree in college - Occupational program
○ Associate degree in college - Academic program
○ Bachelor's degree (For example: BA, AB, BS)
○ Master's degree (For example: MA, MS, MEng, MEd, MSW, MBA)
○ Professional school degree (For example: MD, DDS, DVM, LLB, JD)
○ Doctorate degree (For example: PhD, EdD)

13. What is this person's ancestry or ethnic origin? (See instruction guide for further information.)

(For example: German, Italian, Afro-Amer., Croatian, Cape Verdean, Dominican, Ecuadoran, Haitian, Cajun, French Canadian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Irish, Polish, Slovak, Taiwanese, Thai, Ukrainian, etc.)

14a. Did this person live in this house or apartment 5 years ago (on April 1, 1985)?

○ Born after April 1, 1985 — *Go to questions for the next person*
○ Yes — *Skip to 15a*
○ No

b. Where did this person live 5 years ago (on April 1, 1985)?

(1) Name of U.S. State or foreign country

(If outside U.S., print answer above and skip to 15a.)

(2) Name of county in the U.S.

(3) Name of city or town in the U.S.

(4) Did this person live inside the city or town limits?

○ Yes
○ No, lived outside the city/town limits

15a. Does this person speak a language other than English at home?

○ Yes ○ No — *Skip to 16*

b. What is this language?

(For example: Chinese, Italian, Spanish, Vietnamese)

c. How well does this person speak English?

○ Very well	○ Not well
○ Well	○ Not at all

16. When was this person born?

○ Born before April 1, 1975 — *Go to 17a*
○ Born April 1, 1975 or later — *Go to questions for the next person*

17a. Has this person ever been on active-duty military service in the Armed Forces of the United States or ever been in the United States military Reserves or the National Guard? If service was in Reserves or National Guard only, see instruction guide.

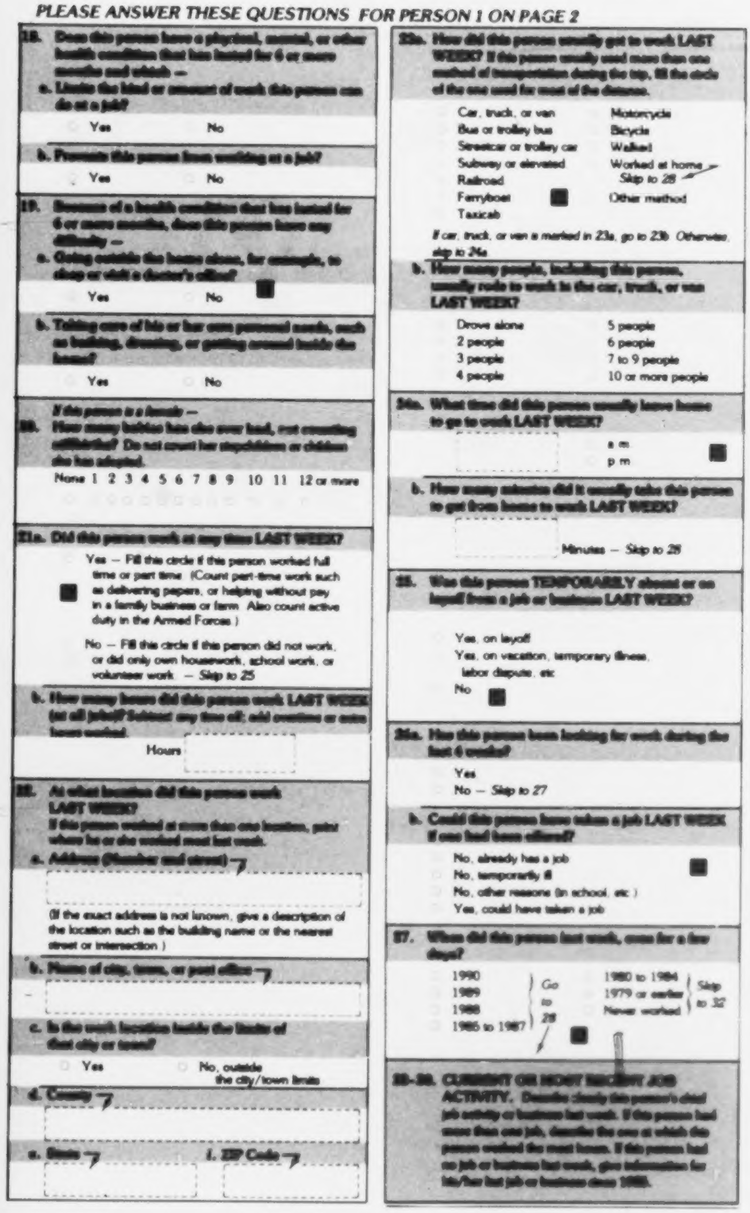
○ Yes, now on active duty
○ Yes, on active duty in past, but not now
○ Yes, service in Reserves or National Guard only — *Skip to 18*
○ No — *Skip to 18*

b. Was active-duty military service during — Fill a circle for each period in which this person served.

○ September 1980 or later
○ May 1975 to August 1980
○ Vietnam era (August 1964—April 1975)
○ February 1955—July 1964
○ Korean conflict (June 1950—January 1955)
○ World War II (September 1940—July 1947)
○ World War I (April 1917—November 1918)
○ Any other time

c. In total, how many years of active-duty military service has this person had?

Years



PLEASE ANSWER THESE QUESTIONS FOR PERSON 1 ON PAGE 2

18. Does this person have a physical, mental, or other health condition that has lasted for 6 or more months and which —

a. Limits the kind or amount of work this person can do at a job?

○ Yes ○ No

b. Prevents this person from working at a job?

○ Yes ○ No

19. Because of a health condition that has lasted for 6 or more months, does this person have any difficulty —

a. Going outside the home alone, for example, to shop or visit a doctor's office?

○ Yes ○ No

b. Taking care of his or her own personal needs, such as bathing, dressing, or getting around inside the home?

○ Yes ○ No

If this person is a female —

20. How many babies has she ever had, not counting stillbirths? Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6	7	8	9	10	11	12 or more
○	○	○	○	○	○	○	○	○	○	○	○	○

21a. Did this person work at any time LAST WEEK?

○ Yes — Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)

○ No — Fill this circle if this person did not work, or did only own housework, school work, or volunteer work. — *Skip to 25*

b. How many hours did this person work LAST WEEK (at all jobs)? Subtract any time off; add overtime or extra hours worked.

Hours

22. At what location did this person work LAST WEEK?

If this person worked at more than one location, print where he or she worked most last week.

a. Address (Number and street)

(If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.)

b. Name of city, town, or post office

c. Is the work location inside the limits of that city or town?

○ Yes ○ No, outside the city/town limits

d. County

e. State

f. ZIP Code

23a. How did this person usually get to work LAST WEEK? If this person usually used more than one method of transportation during the trip, fill the circle of the one used for most of the distance.

○ Car, truck, or van	○ Motorcycle
○ Bus or trolley bus	○ Bicycle
○ Streetcar or trolley car	○ Walked
○ Subway or elevated	○ Worked at home — *Skip to 28*
○ Railroad	○ Other method
○ Ferryboat	
○ Taxicab	

If car, truck, or van is marked in 23a, go to 23b. Otherwise, skip to 24a.

b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

○ Drove alone	○ 5 people
○ 2 people	○ 6 people
○ 3 people	○ 7 to 9 people
○ 4 people	○ 10 or more people

24a. What time did this person usually leave home to go to work LAST WEEK?

○ a.m.
○ p.m.

b. How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes — *Skip to 28*

25. Was this person TEMPORARILY absent or on layoff from a job or business LAST WEEK?

○ Yes, on layoff
○ Yes, on vacation, temporary illness, labor dispute, etc.
○ No

26a. Has this person been looking for work during the last 4 weeks?

○ Yes
○ No — *Skip to 27*

b. Could this person have taken a job LAST WEEK if one had been offered?

○ No, already has a job
○ No, temporarily ill
○ No, other reasons (in school, etc.)
○ Yes, could have taken a job

27. When did this person last work, even for a few days?

○ 1990 ○ 1989 ○ 1988 ○ 1985 to 1987	*Go to 28*	○ 1980 to 1984 ○ 1979 or earlier ○ Never worked	*Skip to 32*

28-30. CURRENT OR MOST RECENT JOB ACTIVITY. Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give information for his/her last job or business since 1985.

---

18 Similar to the 1980 question. Asks about work disabilities, but no longer asks if a person has trouble using public transportation.

19 New question on functional disabilities. Asks respondents to specify whether they have difficulty going outside the home alone or caring for themselves.

20 Same as in 1980.

21 Same as in 1980.

22 Same as in 1980. These data are collected to provide information on journey to work.

23a Categories in 1990 are slightly different than in 1980. Car, truck, and van have been combined into one category. Bus and trolley care have been separated into two categories. Ferryboat category is new. A write-in space was provided in 1980 for the "other" category, but not in 1990.

23b Similar to the 1980 question. This question applies only to people using cars, trucks, or vans. The top end of the category is now ten or more people, compared with seven or more in 1980.

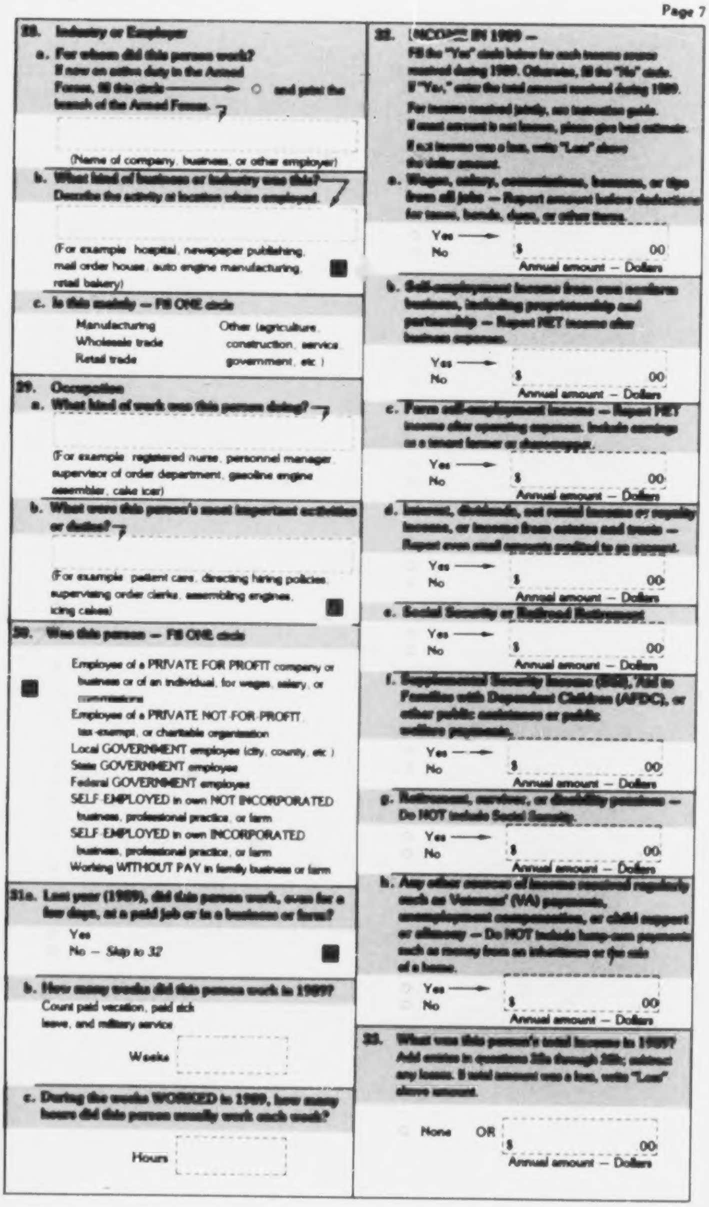
24 In 1980, respondents were asked for the amount of time it took them to get to work. In 1990, respondents are also asked what time they leave for work.

25 Same as in 1980.

26 Same as in 1980.

27 Similar to the 1980 question. Categories have been updated ten years.

Figure 3. The 1990 Census Questionnaire, Annotated (cont.)



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28. Industry or Employer

a. For whom did this person work?
If now on active duty in the Armed Forces, fill this circle → ○ **and print the branch of the Armed Forces.**

(Name of company, business, or other employer)

b. What kind of business or industry was this?
Describe the activity at location where employed.

(For example: hospital, newspaper publishing, mail order house, auto engine manufacturing, retail bakery)

c. Is this mainly — Fill ONE circle

- ○ Manufacturing
- ○ Wholesale trade
- ○ Retail trade
- ○ Other (agriculture, construction, service, government, etc.)

29. Occupation

a. What kind of work was this person doing?

(For example: registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, cake icer)

b. What were this person's most important activities or duties?

(For example: patient care, directing hiring policies, supervising order clerks, assembling engines, icing cakes)

30. Was this person — Fill ONE circle

- ○ Employee of a PRIVATE FOR PROFIT company or business or of an individual, for wages, salary, or commissions
- ○ Employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization
- ○ Local GOVERNMENT employee (city, county, etc.)
- ○ State GOVERNMENT employee
- ○ Federal GOVERNMENT employee
- ○ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm
- ○ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm
- ○ Working WITHOUT PAY in family business or farm

31a. Last year (1989), did this person work, even for a few days, at a paid job or in a business or farm?

- ○ Yes
- ○ No — *Skip to 32*

b. How many weeks did this person work in 1989?
Count paid vacation, paid sick leave, and military service

Weeks

c. During the weeks WORKED in 1989, how many hours did this person usually work each week?

Hours

32. INCOME IN 1989 —
Fill the "Yes" circle below for each income source received during 1989. Otherwise, fill the "No" circle. If "Yes," enter the total amount received during 1989.
For income received jointly, see instruction guide.
If exact amount is not known, please give best estimate.
If net income was a loss, write "Loss" above the dollar amount.

a. Wages, salary, commissions, bonuses, or tips from all jobs — Report amount before deductions for taxes, bonds, dues, or other items.

○ Yes → $ 00
○ No
Annual amount — Dollars

b. Self-employment income from own nonfarm business, including proprietorship and partnership — Report NET income after business expenses.

○ Yes → $ 00
○ No
Annual amount — Dollars

c. Farm self-employment income — Report NET income after operating expenses. Include earnings as a tenant farmer or sharecropper.

○ Yes → $ 00
○ No
Annual amount — Dollars

d. Interest, dividends, net rental income or royalty income, or income from estates and trusts — Report even small amounts credited to an account.

○ Yes → $ 00
○ No
Annual amount — Dollars

e. Social Security or Railroad Retirement

○ Yes → $ 00
○ No
Annual amount — Dollars

f. Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments.

○ Yes → $ 00
○ No
Annual amount — Dollars

g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

○ Yes → $ 00
○ No
Annual amount — Dollars

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, or child support or alimony — Do NOT include lump-sum payments such as money from an inheritance or the sale of a home.

○ Yes → $ 00
○ No
Annual amount — Dollars

33. What was this person's total income in 1989?
Add entries in questions 32a through 32h; subtract any losses. If total amount was a loss, write "Loss" above amount.

○ None OR $ 00
Annual amount — Dollars

---

28 Same as in 1980

29 Same as in 1980

30 Similar to the 1980 question, but in 1990, private for profit and private not for profit are separated into two categories

31 Similar to the 1980 question, but no longer asks if the person looked for work during the weeks in which the person was not employed

32 Similar to the 1980 question. Pension income is distinguished from "other" sources of income for the first time. In 1990, income from estates and trusts is combined with the income from interest, dividends, net rental income, and royalties

33 Same as in 1980

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Note: Because of our format we have reduced the size of the questionnaire by about 60 percent and omitted certain instructions to respondents and Census Bureau use boxes. The census questionnaire also will have blue shading, not gray.

Census Geography

The success of the census depends not only on how well the Census Bureau locates all living quarters and collects complete information for each occupant, but also on how accurately this information is linked to its specific geographic location.

All geographic areas used by the census fall into one of two categories: they are either "statistical areas" or "political and administrative areas," which typically have their boundaries set by law or statutes. Examples of political areas are states, cities, congressional districts, American Indian reservations, and voting districts.

The Census Bureau defines statistical areas to meet the needs of the census and users of statistics. Ideally, each such area is a single, contiguous piece of territory. Examples of statistical areas are MSAs (metropolitan statistical areas established by the OMB), census tracts, block groups, and census blocks. Census blocks are the smallest geographic statistical unit used for enumerating housing units and reporting census data.

Most census geography conforms to a hierarchy in which large areas are formed by combining smaller areas. Statistics from small units of geography can, therefore, be combined to provide information for more than 25 different types of larger geographic areas.[27]

For the 1990 Census, a key geographic statistical unit is the census tract. The Census Bureau and committees of local government officials have created some 49,000 census tracts. There are also over 11,000 "block numbering areas," or BNAs, which are similar to census tracts but are located almost exclusively in nonmetropolitan areas. BNAs are defined by state offices or by the Census Bureau, with advice from state officials.

Within each census tract or BNA are up to nine subdivisions called "block groups," which are used as a framework for numbering census blocks. In cities and other urban areas, census blocks tend to be the same as city blocks. In suburban and more sparsely-settled areas, the census blocks—which are defined primarily by roads and by other visible features of the landscape—may be large in area and irregular in shape.

A major difference between the 1990 and earlier censuses is that, for the first time, the entire United States, as well as Puerto Rico and the outlying areas, has been divided into about 7.5 million census blocks, 3 times the number in 1980. This improvement will allow the Census Bureau to report its findings for all areas at a greater level of detail than before.

Computer Geography

Without modern computers, there could be no modern census. This fact is as true of the census geographic support program as it is of field operations or data tabulation. For the 1980 Census, the geographic procedures were barely adequate to the task, largely because they were not computerized.

"For the 1980 Census, we prepared the three major geographic tools—maps, address reference files, and geographic reference files—in independent operations involving a great deal of clerical work," reports Peter A. Bounpane, Assistant Director for Decennial Census. Because they were constructed independently, each of these three products described the same portion of the earth in a slightly different way. "These processes were slow and error-prone, leading to production delays, mistakes, and inconsistencies."

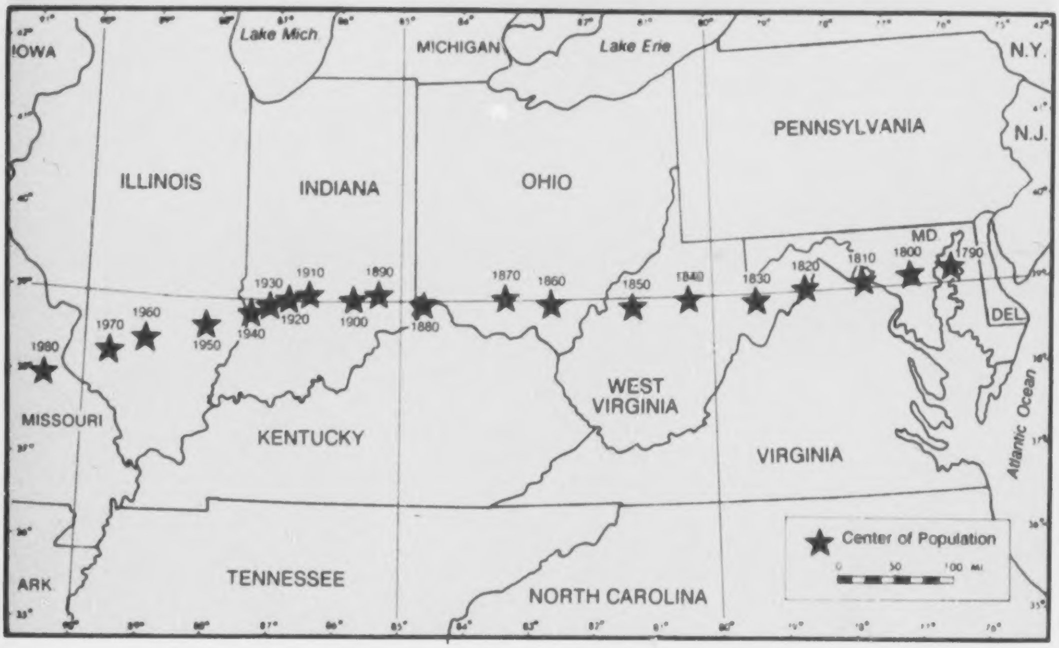
Beginning in 1981, as results from the 1980 Census were still being tabulated, the Bureau began to create a new computerized geographic system—"TIGER," for "Topologically Integrated Geographic Encoding and Referencing." TIGER is a completely new system that uses modern computer technology to avoid the kinds of errors that plagued the 1980 Census geographic program.[28]

Working with the U.S. Geological Survey, and primarily using the Survey's 1:100,000-scale national map series, the Bureau has successfully built a geographic computerized data base. While building such a data base is a complex procedure, it basically converts into machine-readable format, or "digitizes," individual geographic features from a printed map. Each type of geographic feature is assigned a unique computer code in the data base that differentiates it from all other features.

With its new geographic data base the Census Bureau can readily produce by computer a variety of consistent maps—maps for enumerators to use while listing residential addresses or following up at housing units that did not return census questionnaires; maps for district offices

Figure 4. Center of Population: 1790 to 1980

Year	Approximate location
1790 (Aug. 2)	**23 miles east of Baltimore, Md.**
1850 (June 1)	**23 miles southeast of Parkersburg, W. Va.**
1900 (June 1)	**6 miles southeast of Columbus, Ind.**
1950 (Apr. 1)	**8 miles north-northwest of Olney, Richland County, Ill.**
1980 (Apr. 1)	**¼ mile west of De Soto in Jefferson County, Mo.**


IOWA
Lake Mich
MICHIGAN
Lake Erie
N.Y.
PENNSYLVANIA
N.J.
ILLINOIS
INDIANA
OHIO
MD
1790
1800
1810
1820
1830
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1850
1860
1870
1880
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1980
DEL
MISSOURI
WEST VIRGINIA
KENTUCKY
VIRGINIA
Atlantic Ocean
ARK
TENNESSEE
NORTH CAROLINA
★ Center of Population
0
50
100 MI

Note: the "center of population" is the point at which the United States would balance perfectly if it were a flat surface and every person on it had an equal weight. The westward, and more recent, southward trend is a reflection of the nation's dramatic population shifts recorded by each decennial census.

Source: U.S. Bureau of the Census, *1980 Census of Population*, Vol. 1.

to use in determining enumerator assignments; and maps to supplement the data that will be published from the 1990 Census. The Census Bureau will prepare individual maps for over 300,000 separate enumerator assignment areas and over 39,000 governmental units, displaying the names and boundaries of most data collection and tabulation areas.[29]

Because all census geography now exists in a single computer file, many address lists and statistics collected in the census can be linked directly to the file. It is far less time consuming to update the file. All changes are automatically reflected in all products created from the file. "The TIGER System integrates into one computer file all the geographic information that we produced separately for the 1980 Census," Peter Bounpane notes. This is an impressive accomplishment.

As well as improving census operations, the TIGER System will make possible a variety of other computerized geographic products. "It is easy to let one's imagination conjure up new and exciting products—full-color maps of data distributions, microcomputer-based geographic information systems, all the maps for the entire country on a laser disk, direct access to census data tabulations through a 'map' displayed on a color graphics computer terminal," writes Robert W. Marx, Chief of the Census Bureau's Geography Division.[30]

Data Products

If the census were simply a headcount used to achieve representative government, its job would be over once the people were counted and the totals provided to the President and state governors. But the census is also extensively used by virtually every public and private organization. Demand for census data has grown with each census in recent years. After spending billions of dollars to take the census, many people believe the government has an obligation to provide billions of dollars of benefits from its statistics.

U.S. Bureau of the Census
Cartridges containing computerized census data are filed at the Census Bureau's headquarters in Suitland, MD

To understand census data products, it is useful to consider a basic concept: The larger the geographic area, the more detailed subject matter information is available; the smaller the area, the less detail. The Census Bureau cannot publish all of the data it gathers because we would all drown in the resulting sea of statistics. For the approximately 7.5 million census blocks, it will produce only headcounts and a few basic characteristics from the short-form questionnaire. For the nation as a whole, the 50 states, metropolitan areas, and other large geographic units, it will produce detailed population and housing statistics. This concept also helps determine which statistics the Census Bureau releases on computer tape or in printed reports. A population profile of the United States is most useful as a printed national summary publication, while detailed population characteristics at the census-tract level for all 50 states will be most conveniently used on computer tapes.

Following the 1980 Census, the Bureau was not able to complete all of the publications it had planned because of unexpected budget and processing limitations. The Bureau's planners have tried to learn from this experience to improve the publication program for 1990 and, in particular, promise more timely release of data products. Once the computer tapes containing redistricting statistics have been completed, the first general purpose computer tape will become available during the middle of 1991, and the first printed report will follow 6 to 8 weeks later. There will be a steady flow of data products until the last product is released, scheduled for the latter part of 1993.[31]

These products will be similar to those from the 1980 Census, but with a few important changes. Following the 1980 Census, one of the computer tapes most in demand was paid for not by the government itself but by a consortium of private organizations. This file presented detailed demographic data by ZIP Code; the Census Bureau will produce its own ZIP Code computer tape with 1990 data. But Summary Tape File 5, which contains detailed cross-tabulations from the long-form questionnaire, is being discontinued because of limited interest from data users for this product after 1980.[32]

Printed publications have been the principal means of releasing census data since 1790, when the complete census report filled just 56 pages. Costs of printing have risen sharply in recent years, however, and the data to be published have proliferated. The number of pages published by the Bureau rose from about 100,000 in 1960, to 200,000 in 1970, and 300,000 in 1980. Estimates for 1990 are around 500,000 pages. Printed reports remain the most widely used data product from the Census Bureau. At the same time, the computing capabilities of census data users has risen dramatically in the past decade, making computer files of greater potential value.[33]

The Census Bureau will also provide data on compact disks (CD-ROM) because this medium has much greater data storage capacity and flexibility, and prices for this technology are decreasing. The Bureau is also exploring the possibility of making data available on floppy disks for use with microcomputers.

In addition to computer tapes and printed reports, the Census Bureau also releases data on microfiche. Microfiche was used as a product medium for the first time in the 1980 Census. Microfiche is cumbersome to use for large amounts of data, but it provides compact storage and is inexpensive. When budget cuts following the 1980 Census forced the Census Bureau to cancel plans for printed reports of data for the nation's 2.5 million blocks, the Bureau provided this information on microfiche instead.

Computer Tape Files

The Summary Tape Files are the basic vehicles for releasing census data. Printed reports and microfiche in turn are created from these files. There will be two Summary Tape Files that provide data from the short-form census questionnaire received by everyone and two that provide more detailed data from the long-form (sample) questionnaire. The tapes are released on a state-by-state basis as soon as tabulations for the individual states have been completed.

Summary Tape Files receive their name from the fact that they are summaries of data, aggregated from the millions of responses to the census questionnaires. Summary Tape File 1 (STF1) will include population and housing counts and a few characteristics from the short-form questionnaire, similar in content to the 1980 STF1. There will be four files within STF1 (A, B, C, and D), providing different geographic presentations of the data.

Summary Tape File 2 (STF2), which will comprise three files, will also provide data tabulations from the short-form questionnaire, including more extensive data for race and ethnicity (Questions 4 and 7 on the questionnaire).

Summary Tape File 3 (STF3) and Summary Tape File 4 (STF4) will contain data from the long-form questionnaire, similar to the comparable tapes released after the 1980 Census. There will be four files within STF3, including data for states and specified areas below the state level, 5-digit ZIP Codes, the United States and such subareas as regions, divisions, states, and counties, and a file presenting data for congressional districts. Summary Tape File 4, in three files, will provide similar statistics with greater detail on such subjects as race and ethnicity.

The Census Bureau also will provide two sets of computer tapes that contain a sample of responses to individual questionnaires, without containing any information about the household address or identity of its residents. These "public-use microdata samples," or PUMS, are of great interest principally to academic researchers who do their own tabulations in order to study some characteristics in more detail. To further protect the confidentiality of individual records, these files will be available only for areas with at least 100,000 residents. Two sets of PUMS are planned: a 5-percent sample in geographic areas that meet the 100,000 population minimum requirement, and a 1-percent sample in metropolitan areas.

Printed Reports

Census Bureau printed reports follow an organization similar to that of the summary tape files from which they are prepared. There are three series that present, in turn, data for population characteristics alone, for population and housing characteristics together, and for housing characteristics alone. Some publications report tabulations from the short-form questionnaire and others from the long form. The information is released on a state-by-state basis, as individual state tabulations are prepared, with national summaries released once the state volumes are completed.

The three series are the 1990 Census of Population (1990 CP), 1990 Census of Population and Housing (1990 CPH), and 1990 Census of Housing (1990 CH). Each of these series contains several volumes, with such titles as "Population and Housing Characteristics for Census Tracts and Block Numbering Areas" and are also identified by the state or metropolitan area on which they report. In general, the subject matter is similar to that published from the 1980 Census. Basic population and housing data will be published for small geographic areas, down to the block level, and more detailed data will be published for large geographic areas such as states and metropolitan areas.

In addition, the Census Bureau plans to publish a series of about 30 population and 10 housing subject reports for the 1990 Census, dealing with such topics as families and living arrangements, the elderly, migration, income, recent movers, and other topics of widespread interest. These would contain less geographic detail but much more subject matter detail on these topics than will be available in other reports. The information contained in these printed reports would also be available on computer tape in a series of about 20 Subject Summary Tape Files (SSTFs).

Finally, the Census Bureau is also considering publishing a report that provides a broad range of data about the population at the national, state and metropolitan area levels. This report would be published as soon as possible in the tabulation and publication schedule to provide the first overall account of the American population as revealed by the 1990 Census. A similar report followed the 1980 Census.[34]

Obtaining Data

There are several different ways to obtain census data products. The U.S. Government Printing Office sells the printed volumes by mail. Selected volumes are also available in bookstores and Commerce Department district offices. Many census reports are available in hundreds of libraries that have been designated Federal Depository and Census Depository Libraries. In addition, the Census Bureau's State Data Centers in every state have copies of printed reports and offer assistance in obtaining and using census data on computer and microfiche as well. (They are listed on pages 39-42 together with addresses of Census Bureau regional offices.)

Computer tapes, microfiche, and prints from microfiche are sold directly by the Census Bureau through its Data User Services Office. The Bureau annually publishes the *Census Catalog and Guide*, which lists all products available from the Bureau. The *Monthly Product Announcement* keeps this information up to date. The Census Bureau also plans to publish a guide on how to obtain useful information from the 1990 Census, similar to the *1980 Census of Population and Housing Users' Guide*.

"The Bureau will not only continue to seek the most appropriate media for making its data available, but will also work to promote their use—through education and training programs, user-support systems, and seeking new ways to foster awareness of census data and their value," according to Paul T. Zeisset of the Census Bureau.[35]

Reapportionment and Redistricting

Apportioning seats in the House of Representatives is one of the most basic uses of census data, and also among the most contentious, because it directly affects political power. The first presidential veto was cast in 1792, when George Washington disagreed with the apportionment method selected by Congress. After the 1920 Census, taken at a time when over 50,000 immigrants were arriving in the U.S. each month[36] and with the House fixed at 435 members, agreement proved so difficult that there was no reapportionment at all—the only time this has happened.

Once the Founding Fathers had agreed to a bicameral legislature, with a House of Representatives where the number of members would be determined by the size of the population in each state, they needed a method for maintaining equal representation in the face of rapid population growth and migration. The census filled that role (see Table 4, page 32).

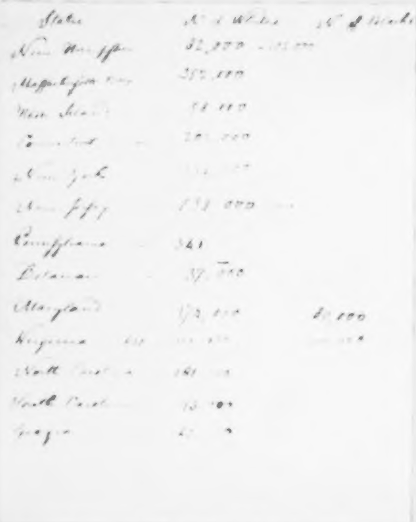
Agreement at the Philadelphia Convention in 1787 to have a census every ten years bogged down in acrimony between northern and southern states over how to include slaves. This dispute resulted in the compromise by which slaves were counted as three-fifths of a free person. A deadlock in Congress after the Civil War over counting freed blacks in southern states for apportionment ceased only with the passage of the Fifteenth Amendment on voting rights after the 1870 Census.

Throughout the nation's history, a variety of different apportionment methods have been proposed and several different formulas used. The current method, which has been used since 1940, is called the Method of Equal Proportions.[37] The role of the census in apportionment is to provide the population counts that, when used in the formula determined by Congress, allocate to each state its proper number of seats.

The federal law that specifies April 1 as Census Day requires that "The tabulation of total population by States . . . as required for the apportionment of Representatives in Congress among the several States shall be completed within 9 months after the census date and reported by the Secretary to the President of the United States."[38]

Within ten days of the opening of the next session of Congress, the President must transmit to the Clerk of the House of Representatives the census count for each state and the number of Representatives to which each state is entitled, in accordance with the method of apportionment selected by the Congress. And within 15 days after that, the Clerk must notify each state governor of the number of Representatives that state will be en-

Box 2. The Great Compromise



Record Group 360, Records of the Constitutional Convention. National Archives, Washington, D.C.

Deadlock at the Constitutional Convention meeting in Philadelphia in 1787 led to the "Great Compromise" whereby each state would have two Senators (satisfying the small states) and the number of Members of the House of Representatives per state would be based upon the size of the population in the state (satisfying the larger states). These population estimates from the Convention were probably used to help calculate states' representation, based on "one Member for every forty thousand inhabitants." Many of the estimates were very far from the actual numbers counted in the 1790 Census.

titled to in the next Congress.[39]

When Congress is reapportioned after the 1990 Census, California, Texas, and Florida are expected to gain a total of 12 seats at the expense of states in the Northeast and Midwest. Because of population shifts during the decade, California is likely to pick up five seats, Texas four, and Florida three. Other probable gainers include Arizona and Georgia, each adding two seats, and North Carolina and Virginia, each adding one.

New York and Pennsylvania are projected to lose three House seats apiece. Illinois, Michigan, and Ohio may each lose two, and six other states one each: Kansas, Iowa, Massachusetts, Montana, West Virginia, and Wisconsin. If these calculations, based on Census Bureau population projections, are correct, California would become the first state to have 50 seats in Congress. "If these trends continue, . . . the political power base of the Northern tier will further erode," according to the Population Reference Bureau.[40]

In comparison with its Constitutional role in reapportionment, the relationship of the census to redistricting—redrawing district electoral lines within each state—is much more recent. Until the 1960s and 1970s, state legislatures were almost entirely free to draw political boundaries as they wished, but during the mid-1960s a series of court decisions extended the requirement for equal representation by population to the state and local levels. These decisions greatly increased the demand for census data for redistricting purposes.

In 1975, Congress enacted Public Law 94-171 to amend the Census Law giving the Census Bureau a legal role in providing census counts for redistricting state legislatures. Under the law, the Census Bureau must provide population counts for small geographic areas to the legislature and governor of each state within one year following the census. For 1990, in addition to providing counts for such standard geographic areas as counties, census tracts, and blocks, the Census Bureau plans to provide population counts by voting districts, aggregated from block-level data, for states participating in a Census Bureau program.[41] To date, all of the 50 states and the District of Columbia have indicated that they are participating in this program.

In 1991, all state legislatures and governors will receive 1990 Census counts tabulated by major racial groups and

Hispanic origin for the total population and for the voting-age population. The Census Bureau will provide these data at the block level for every county, city, town, and census tract BNA in the state.

Redistricting typically has been done by handfuls of political pros negotiating out of the public eye behind closed doors in smoke-filled rooms. One can find many examples in our history of unequal representation, both because districts have been manipulated —"gerrymandered" —to serve political ends and because areas have not been redistricted at all in spite of population change. At the time of the 1964 "one person-one vote" Supreme Court decision, Louisiana had not been redistricted since 1912.[42]

Before the court's historic decision, Congressional districts within a state could be—and often were—of vastly different sizes. For example, in 1930, New York's largest district contained a population of 776,425 per Representative, and its smallest district only 90,671. In 1962, Maryland's largest district had 711,045 people versus 243,570 in its smallest district. Such disparities had the effect of giving highly populated districts no more political influence than much smaller districts.[43]

Now, the combination of microcomputers and small-area population totals open participation in redistricting to any group with a stake in the outcome. The early 1990s are likely to see a cottage industry in redistricting, as political parties, public interest groups, legislators, and would-be political candidates, aided by a host of consultants, vie to create political boundaries that both serve their own interests and meet the legal guidelines. The courts may continue to take a keen interest in redistricting by insisting on increasingly strict interpretations of what constitutes acceptable definitions of "one person-one vote."

Accounting for Undercount

No matter how hard we try, it will prove impossible to obtain an accurate count of

Table 4. Apportionment of Membership in House of Representatives, by Region, 1790 to 1980

Year	Membership based on census of year				Total number of seats
	Northeast	Midwest	South	West	
1790	57	(x)	49	(x)	106
1800	76	1	65	(x)	142
1810	97	8	81	(x)	186
1820	105	19	89	(x)	213
1830	112	32	98	(x)	242
1840	94	50	86	2	232
1850	92	59	83	3	237
1860	87	75	76	5	243
1870	95	98	93	7	293
1880	95	117	107	13	332
1890	99	128	112	18	357
1900	108	136	126	21	391
1910	123	143	136	33	435
1930	122	137	133	43	435
1940	120	131	135	49	435
1950	115	129	134	59	437
1960	108	125	133	69	435
1970	104	121	134	76	435
1980	95	113	142	85	435

Note: No reapportionment based on 1920 Census.

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States, 1988*, 108th edition (Washington, D.C.: Government Printing Office, 1987) p. 242, which also contains listings for each state.

every American as of a single day, April 1, 1990. No census has ever been 100 percent accurate, and none ever will be.

It may also be too much to expect that every group in our society will be counted with exactly the same degree of accuracy. Voting behavior, social attitudes, family structure, income, education, and many other characteristics differ by age, sex, ethnicity, and race. So does participation in the national census. It is relatively easy to enumerate the middle class in their suburbs, because they live at easily-identified addresses, and are likely to receive and return their census questionnaire. But it is much more difficult to enumerate the poor and the alienated, because it is both harder to locate them—they live disproportionately in isolated rural areas and inner-city slums—and more difficult to enlist their cooperation when they are located.

Throughout our two centuries of census taking, states and localities have periodically complained that their areas were undercounted by the census. From time to time, evidence of serious undercounting has appeared. For example, the 1870 Census was thought to have seriously undercounted the population of the South. "Interpolation back from the 1880 figures indicate a potential total undercount of 1.2 million in the South and a black undercount of .5 million—over 10 percent of the black population," according to social historian Margo J. Anderson.[44]

Census Bureau studies after the 1980 Census showed that 99 percent of whites had been enumerated but only 94 percent of blacks. The Bureau's studies showed the highest undercount rates were for black males between the ages of 25 and 54, fully 15 percent of whom were missed.[45] The Hispanic population was probably also disproportionately undercounted by the 1980 Census.

Even before the 1990 Census questionnaire went to the printer, a lawsuit was filed that seeks to force the Census Bureau to adjust the actual count using statistical methods, in anticipation of another undercount that will vary by race. Following the 1980 Census, a total of over 50 similar suits were filed. In each of these cases, some of which took nearly the entire decade to complete, the courts found in favor of the government position not to adjust for undercount.[46]

Another suit filed more than a year before Census Day, 1990, seeks exclusion of illegal aliens from the 1990 count. The government's position is that the Constitution requires that all persons be enumerated. Further, even if the courts were to direct the Census Bureau to exclude illegal aliens, "any proposed method would be likely to have significant errors that could affect the allocation of one or more congressional seats."[47]

While successfully defending its decision not to adjust the 1980 Census tally, the Census Bureau began intensive research into whether it could develop statistically reliable methods to make adjustments for undercount by the time of the 1990 Census. If the research concluded that developing and using new statistical adjustment techniques could achieve a more accurate count of the true number of inhabitants than not adjusting, then the nation's political leaders and the courts would have the option of adjusting for undercount.

Testifying before Congress in July 1986, the Census Bureau's Associate Director for Statistical Standards and Methodology at that time, Barbara A. Bailar, said of the Bureau's 1990 Census efforts: "We will attempt to take the best census possible and to count everyone, but we also will do what is necessary to be prepared to adjust the counts if we determine that adjustment will improve them."[48] Then-Census Director John G. Keane used the same words in testimony before a Senate committee in September 1986.[49]

Dr. Bailar told Congress that the Bureau would have to establish methods that could accurately measure census coverage for small geographic levels and a variety of population and housing characteristics. Further, it would have to establish and publish standards for evaluating the quality of both the unadjusted and the adjusted census data. Finally, she said, "We have to implement the adjustment, compare the adjusted and unadjusted data in light of the standards, and then release one of the sets of data as the official 1990 Census results."

If there were two sets of official census results—one before and one after adjustment—the decision which to use could become hopelessly politicized. The goal of accuracy would be lost in the calculations of which localities and politicians would gain or lose by using which of the two sets of statistics. Any adjustment decision would need to be firmly agreed to *before* the outcome of the census were known or else we risk endless rounds of second-guessing, political maneuvering, and lawsuits that could seriously weaken the credibility of the census.

The Census Bureau began its adjustment research in 1984. By the summer of 1987, the researchers concluded that it might be possible technically to make statistical adjustments to the census counts that would come closer to the true number of inhabitants than not making an adjustment. However, many operational and policy questions remained.

Because the Bureau appeared to be making progress in developing satisfactory adjustment methods, advocates of adjustment began to take new heart. "Census Bureau is Urged to Adjust 90 Count to Include Those Missed," headlined a *New York Times* article on August 20, 1987. It noted that while statisticians remained divided, Democratic officials generally supported adjustment and Republicans opposed it. Representative Mervyn Dymally, a California Democrat who chaired the House Subcommittee on Census and Population, introduced a bill ordering adjustment, but it was never brought to a vote.

The Staff Director of the House Subcommittee on Census and Population, TerriAnn Lowenthal, told state and local officials, "Based on several hearings before our subcommittee and numerous consultations with the experts, we believe a consensus has emerged that a full-scale Post Enumeration Survey is a statistically valid and technically feasible method of adjusting the raw census counts. The time has come to carry out an adjustment of the decennial census figures to eliminate known undercounts and overcounts of the population."[50]

But late in October 1987, the Department of Commerce, the Census Bureau's parent agency, announced that the government had decided not to adjust the results of the 1990 Census. "Adjustment may create more problems than it solves, and may divert resources needed for enumeration," said the Under Secretary for Economic Affairs, Robert Ortner.[51]

Additional reasons offered by Ortner included the likely controversy that adjustment would generate, the suspicion it might create about the reliability and integrity of census statistics, and the fact that, even without adjustment, the Census Bureau expected to achieve a 99 percent accuracy rate. Under Secretary Ortner said, "Adjustment is a threat to the customary process of reapportionment which has been one of the foundations of our political system. The census count has traditionally been accepted as the best count available regardless of the political consequences. Adjusting the count may create the appearance of changing the numbers to achieve a desired political outcome by the party in office."[52]

Following this decision, the Census Bureau's Barbara Bailar, who had guided the research into adjustment methodology, resigned from the government in protest.

In July 1988, C. L. Kincannon, Census Bureau Deputy Director, issued a statement giving the official Census Bureau position on the undercount issue and the Commerce Department decision. He recalled that the Census Bureau had been researching the adjustment issue since 1984, and was continuing its research program in the summer of 1987, before the Commerce Department made its announcement. Based on this research, the Census Bureau Director concluded that the Bureau could "reasonably expect to have the technical capability in 1990 of assessing the undercount." However, "the decision on whether we would actually adjust the 1990 Census would occur in 1990."[53]

Noting that some members of the Bureau's senior staff were not in complete agreement among themselves on the feasibility of adjustment, C. L. Kincannon reported that at a meeting of top Bureau officials held on July 15, 1987, before the Commerce Department decision, a majority agreed "that an adjustment could not be attempted in time for legal deadlines without placing the census itself at unacceptable risk. Most of the group strongly agreed that basic census operations should not be changed and that the efforts to adjust the 1990 Census by legal deadlines should not proceed. In light of the above, the Department of Commerce decided not to adjust the results of the 1990 census," Mr. Kincannon said.[54]

Early in November 1988, when the group of states, cities, and interest groups sued in Federal District Court in Brooklyn to force adjustment to the 1990 Census because of undercounting, Barbara Bailar, now the Executive Director of the American Statistical Association, filed an affidavit to accompany the suit charging that the Commerce Department decision was arbitrary, secretive, and "substantively flawed."[55]

To Adjust or Not to Adjust?

The two sides of the undercount issue have persuasive proponents. While both would agree that the nation should obtain as accurate a count of the population as possible, they disagree about the extent to which the government should attempt to compensate for the failure of the census to count the American underclass as well as it counts the great majority.

The Census Bureau has been a leader in measuring the degree to which the census has fallen short of perfection. Not every country's census, and not every government program, is as forthcoming about its shortcomings. The Bureau has also been a leader in using computerized statistical programs to improve the accuracy of enumeration. The Bureau's computer programs that impute residents and their characteristics, when they are known to exist but information cannot be gathered directly, are statistically sound and proven to be effective.

The Constitutional requirement for a census was drawn up long before the era of the computer or the development of demographic methods or sampling techniques. The Founding Fathers could not have expected an errorless census. The 1790 Census, which took 18 months to complete, yielded a total of 3,929,326, but the government suspected an undercount. "I enclose you also a copy of our census, written in black ink so far as we have actual returns, and supplied by conjecture in red ink, where we have no returns; but the conjectures are known to be very near the truth," wrote Thomas Jefferson to George Washington in 1791. "Making very small allowance for omissions (which we know to have been very great), we are certainly above four millions."[56]

Error has been part of every enumeration for 200 years, and occasionally the errors have been major, but the nation has always agreed to abide by the findings of the actual enumeration, just as it has agreed to abide by the outcome of free elections, without statistically adjusting their results for known demographic differences in voting behavior.[57]

There is irony in the fact that as the census has reached unprecedented levels of accuracy, the cries have become louder for even greater perfection. Pressures for statistical adjustment of census counts have grown as more federal money is allocated to states, cities, and local governments from benefit programs based on census statistics. Knowing that census statistics contain inaccuracies, legislators nevertheless placed more responsibility on these statistics.

The courts will have to decide whether the government is required to statistically add people to the census count. That decision will be historic and will influence census taking in the 21st century.

The Future of the Census

Can we streamline census taking? As costs mount, and enumerators become harder to recruit, are there more efficient methods of enumerating the population? Do we need a census at all? Can we collect the needed information from existing records without troubling Americans with a national inquiry? Or does our Constitution bind us forever to a headcount?

The Census Bureau has established a planning staff for the 21st century to study the needs of future data users, forecast Bureau requirements for enumerators, examine the causes of census error, and analyze emerging computer systems that might become available to assist the next census. "We must evaluate our 1990 experience closely, accurately, and quickly to help the Census Bureau get an early start on the Year 2000 Census," a Census Bureau directive explains.[58]

After each census the Census Bureau conducts an evaluation to plan for the next census. These evaluations often suggest major areas where improvement is needed. For example, the Bureau's decision to build a better computerized geographic system for the 1990 Census emerged from evaluation of the many problems with the geographic program in 1980.

However, the Census Bureau typically cannot take full advantage of new but untested technology without enormous risk because the census is such a large-scale and infrequent activity. Like companies whose lead time for new products is very long, the Census Bureau must make educated guesses about the social environment in which it will conduct the next census, and the staff, equipment, and money that will be available long before it will actually deploy these resources.

Thus, while the Census Bureau is an innovator in the field of statistics, it must proceed slowly. "The pioneering work in statistical sampling, the increasing sophistication of the evaluation of census coverage, the use of self-enumeration and the mail system, and the improvements in census coverage—all of these census innovations have evolved over many decades," the Bureau observes.[59]

In the middle of 1993, shortly after the last publication from the 1990 Census is released, the Census Bureau will receive money from Congress to start the Census of 2000. Another countdown will begin. Soon we will receive the first census portrait of America in the 21st century. ☐

200 Years of Census Taking

Census Day is April 1, 1990

For more information about the 1990 Census contact:

1990 Census Promotion Office
U.S. Bureau of the Census
Washington, DC 20233
(301) 763-1990

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Discussion Points

1. The Constitution calls for an enumeration of the U.S. population to apportion seats in the U.S. House of Representatives. Discuss some of the additional uses of census data at national, state, county, and local levels.
2. It is said that the census provides a "statistical snapshot" of the U.S. population. What are the principal changes in the statistical portrait of the American people from the 1790, 1890, and 1990 (projections) censuses?
3. Give some examples of how changes in census questions have, over the years, reflected changes in the U.S. society.
4. What are some of the obstacles to achieving a "perfect" enumeration? Which groups are most likely to be undercounted? What steps are being taken to improve the 1990 enumeration prior to the census, at the time of the census, and in processing census data?
5. Describe the special efforts planned to count the homeless population in 1990.
6. Describe changes in apportionment, by region, since 1790. What changes are expected after the 1990 enumeration?
7. What role does the census play in the redistricting of state and local level legislatures? Describe redistricting practices prior to 1975.
8. How do non-government groups use census data?
9. What is the basis for many of the numerous lawsuits concerning census counts?
10. Explain the advantages and disadvantages of adjusting the 1990 Census count. Do you agree with the Administration's decision not to adjust?

Prepared by Kimberly A. Crews

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POPULATION BULLETIN
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The Graying of Japan

By Linda G. Martin

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Abstract—Japan's rapidly aging population has become a top policy issue, especially as the increasing costs of pensions and medical care are debated. With the highest life expectancy on earth, the Japanese potentially face long periods of retirement, as well as the possibility of long periods of disability. Although family support of the elderly is thought to have been strong traditionally, the recent decline in co-residence with children is one indication that the way that support is given may be changing. This issue is of particular concern to the government, which wants to avoid any greater responsibility for the elderly than is necessary given the dramatic population aging yet to come.

The government is also encouraging employers to provide more employment opportunities for the elderly at the same time that it is trying to raise the eligibility age for receipt of public pensions. There is resistance on the part of employers, however, because wages and retirement allowances in Japan are positively related to length of employment. Furthermore, it is not clear whether elderly Japanese of the future will be as willing to work, if they learn to enjoy increased leisure early in their careers.

Nevertheless, is is unlikely that population aging will lead to Japan's economic decline. Although the saving rate may decline somewhat, restructuring of the economy and continued overseas investment should keep the economy growing in the long run. Important in both the care of the frail elderly and the continued growth of the economy will be the roles played by middle-aged Japanese women.

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By Linda G. Martin

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By the year 2025, nearly one-quarter of Japan's population will be over the age of 65, creating many challenges for policymakers.

The Graying of Japan

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The population of Japan is aging faster than any on earth, a result of declining birth and death rates. The situation of the elderly of Japan is like the proverbial glass of water that is either half full or half empty, depending on whether the positive or negative aspects of their lives are emphasized. In some ways, elderly Japanese are better off than the elderly of the other developed countries. They hold the position of "honorable elders," a reflection of the Confucian precept of filial piety. Japan even has a national holiday, Respect for the Aged Day, September 15th, when most offices and factories are closed. Furthermore, a relatively high proportion of elderly Japanese live with their adult children, which is often cited as evidence of the reverence this country pays to the aged.

However, it can also be argued that elderly Japanese are not really so well off and that the "ecstasy years" of old age are losing their rosy glow—if they truly ever had one. Among the more sensational evidence cited are the supposedly high rate of suicide among elderly Japanese and the existence of temples where the elderly go to pray for a quick death. Also, in recent years, the number of activities for or honoring the elderly on their special day have been few and far between. For most Japanese, September 15th is just another holiday.

The lives of elderly Japanese are changing considerably—for better or worse. For example, the proportion living with their children declined from 77 percent in 1970 to 65 percent in 1985, but over the same period, the suicide rate fell from 54 to 45 deaths per 100,000 for persons ages 65 and over.[1]

The particularly rapid pace of aging in Japan and the potential consequences have captured the attention of policymakers and officials. *Japan in the Year 2000*, the 1982 report of the top-level Long-Term Outlook Committee of the Economic Planning Agency,[2] listed population aging along with internationalization and maturation of the economy as the three major challenges for 21st-century Japan. Japanese prime ministers have regularly referred to aging as they have set the policy agenda, recognizing that population aging affects many aspects of the society and the economy.

For example, just as the population is aging, so is the labor force. An important question facing policymakers is: How can Japan make use of the growing number of older workers and continue its economic success, especially given the seniority-based wage system and lifetime employment? Furthermore, economic theory suggests that an older population will lead to a lowering of the saving rate. In the 1985 White Paper on the Economy, the Japanese Economic Planning Agency predicted that as a result of population aging, the extraordinarily high Japanese saving rate would be cut in half in the 21st century.[3] Other economists have questioned this prediction, and there is also debate about the implications of aging for investment, both at home and overseas, and consequently, debate about the implications for the balance of payments.

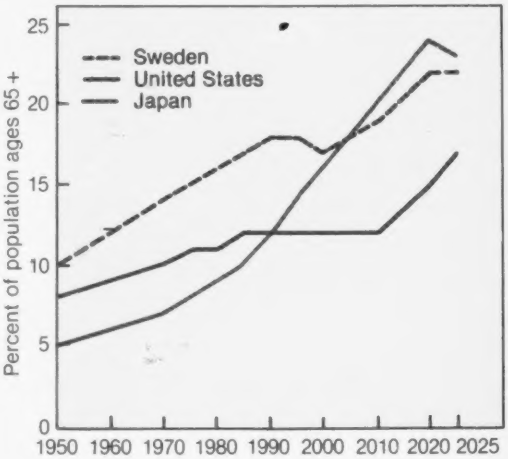
Perhaps the greatest challenge facing Japan is how to provide for the increasing numbers of elderly in the 21st century when close to one-quarter of the population will be over age 65. There is a growing recognition that more public and private services will be necessary to care for the elderly. In opening the January 1988 session of the Diet, the national legislative body, then Prime Minister Noboru Takeshita highlighted the need for review of the national health insurance system and pension schemes and for improved nursing homes for the aged. The costs of increased services will be tremendous. One indicator of the financial burden to be borne by government, the percentage of Japan's Gross Domestic Product devoted to social expenditures, is projected to grow from 14 to 27 percent between 1983 and 2025.

Policymakers are concerned that the government increasingly is being expected to play a larger role in the care of the elderly while the individual elderly person and families play smaller roles. Recent pension, medical insurance, and tax reforms have all been designed to shift the balance somewhat away from the government. In this vein, the 1987 White Paper on Health and Welfare emphasized the importance of home care of the elderly and stressed the importance of family members as care-givers.[4]

However, with longer lives, fewer elderly living near or with their children, and increased employment of middle-aged women, the traditional caretakers of the elderly, a smaller proportion of elderly Japanese can rely upon care by family members. Even where such care is provided, there is some evidence of considerable family stress and poor quality of care.[5]

This *Bulletin* examines the demographic determinants and pace of population aging in Japan; the family situations of older Japanese; their labor force participation and programs to encourage them to continue working; the provision of pensions, medical care, and social services; and the implications of aging for economic performance and international economic relations. It will also investigate how Japan is adapting to

Figure 1. Percentage of Population 65 and Over in Japan, Sweden, and the United States: 1950-2025



Sources: Japan Institute of Population Problems, *Latest Demographic Statistics 1987* (Tokyo: Ministry of Health and Welfare, 1988) p. 70. The projections for Japan are based on the institute's middle-series projection, whereas the projections for the other countries are based on United Nations, *World Population Prospects: Estimates and Projections as Assessed in 1984* (New York: 1986).

Table 1. Projections of the Elderly Japanese Population, 1985-2025

	1985	2000	2010	2025
Number (1000s) 65 +	12,472	21,338	27,104	31,465
Percent of total population	10.3	16.6	20.0	23.4
Percent of population aged 65 +	62.2	60.4	54.0	44.8
65-74	31.5	30.4	35.1	40.1
75-84	6.3	9.3	10.9	15.1
85 +				
Sex ratio (Males/100 females)	69.2	73.7	76.5	76.8

Source: Japan Institute of Population Problems, *Population Projections for Japan: 1985-2025* (Tokyo: Ministry of Health and Welfare, 1987).

population aging and to what extent its experiences can be viewed as a model for the West or for rapidly developing countries of Asia.

The Demographics of Aging

During the first quarter of the 20th century, Japan experienced the high mortality and fertility levels characteristic of many present-day developing countries. In 1925, life expectancy at birth was about 45 years and women gave birth to a total of 5.1 children, on average, during their childbearing years.[6] But both mortality and fertility fell rapidly in the ensuing decades. By 1950, life expectancy had increased to 60 years and the total fertility rate (TFR), or average number of lifetime births per woman under current birth rates, had fallen to 3.7 children. The demographic change after World War II was even more dramatic. By 1960, the TFR had fallen below the replacement level of 2.1 children per woman (the number of children needed to just replace a couple in the population). Between 1977 and 1987, the TFR was stable at about 1.8 children. Japanese life expectancy is now the highest on earth—in 1987, 76 years for males and 82 years for females. With no significant international migration, the low fertility and mortality yield an annual population growth rate of only 0.5 percent.

Japan began its demographic transition from high to low fertility and mortality much later than the United States and other developed countries, but finished it with record speed. The transition occurred in less than 50 years, resulting in the extremely rapid aging of the Japanese population, as shown in Figure 1. Although the proportion of the population ages 65 and over—10 percent in 1985—is less than in many other developed countries such as the United States (12 percent) and Sweden (17 percent), by the year 2025, Japan is projected to have one of the most elderly populations on earth with 23 percent over age 65. In absolute numbers, the elderly population of Japan is expected to increase from 12.5 to 31.5 million between 1985 and 2025 (see Table 1), which will escalate the demand for age-related services, such as medical care.

As in other developed countries, Japan's elderly population itself will age in the coming decades. As shown in Table 1, the proportion of the elderly population in the 65-74-year-old group will decline, while the proportions in the 75-84 and 85-and-older groups will increase. This change in the elderly age

Table 2. Average Life Expectancy and Major Causes of Death: Selected Countries, 1980s

	Life expectancy (yrs.)		Deaths per 100,000		
	Male	Female	Heart Disease	Cancer	Cerebrovascular Disease
Japan, 1987	75.9	82.1	118	164	102
Australia, 1986	73.0	79.6	240	174	78
Canada, 1986	73.1	79.9	229	188	55
Denmark, 1986	71.9	77.8	366	286	102
England and Wales, 1987	72.6	78.3	356	280	138
France, 1986	71.8	80.0	204	240	108
Iceland, 1987	74.9	79.0	238	178	72
Sweden, 1986	74.0	80.2	425	231	117
United States, 1986	71.4	78.6	308	195	62
West Germany, 1987	72.2	78.9	363	272	142

Source: World Health Organization, *1988 World Health Statistics Annual* (Geneva, 1988).

distribution will have important implications for public policy.

Another common feature that Japan shares with the West is the significantly feminine nature of old age. In 1985, there were 69 older males for every 100 older females in Japan. Nevertheless, as shown in Table 1, this ratio is expected to increase to 77 males per 100 females by 2025, because, even though women are still expected to outlive men, survival up to age 65 is projected to increase more for males than for females.

Fertility Decline and Aging

In its initial stages population aging is primarily caused by fertility reduction, although in its later stages mortality decline plays the more important role. Today in the developed countries, including Japan, fertility is generally stable at a low level. Most Japanese demographers expect fertility to remain below the replacement level for the foreseeable future. Toshio Kuroda, a preeminent Japanese demographer, argues that the "small family orientation" is well entrenched.[7] He cites the high cost of housing and children's education, increased employment of women, and the majority opinion of young people, women especially, that at least some period of "single life" before marriage may be desirable. The average age at first marriage has increased gradually from 26.9 years for males and 24.2 years for females in 1970 to 28.3 and 25.6 years, respectively, in 1986. The divorce rate, though low by international standards, is increasing. Japan's contraceptive use rate, though primarily of traditional methods, is comparable to other more developed countries, and its abortion rate is extremely high.[8] All these factors point to continued low fertility. Even if fertility were to increase moderately, it would not slow the aging process significantly over the next few decades.

Mortality Decline: Longer Lives

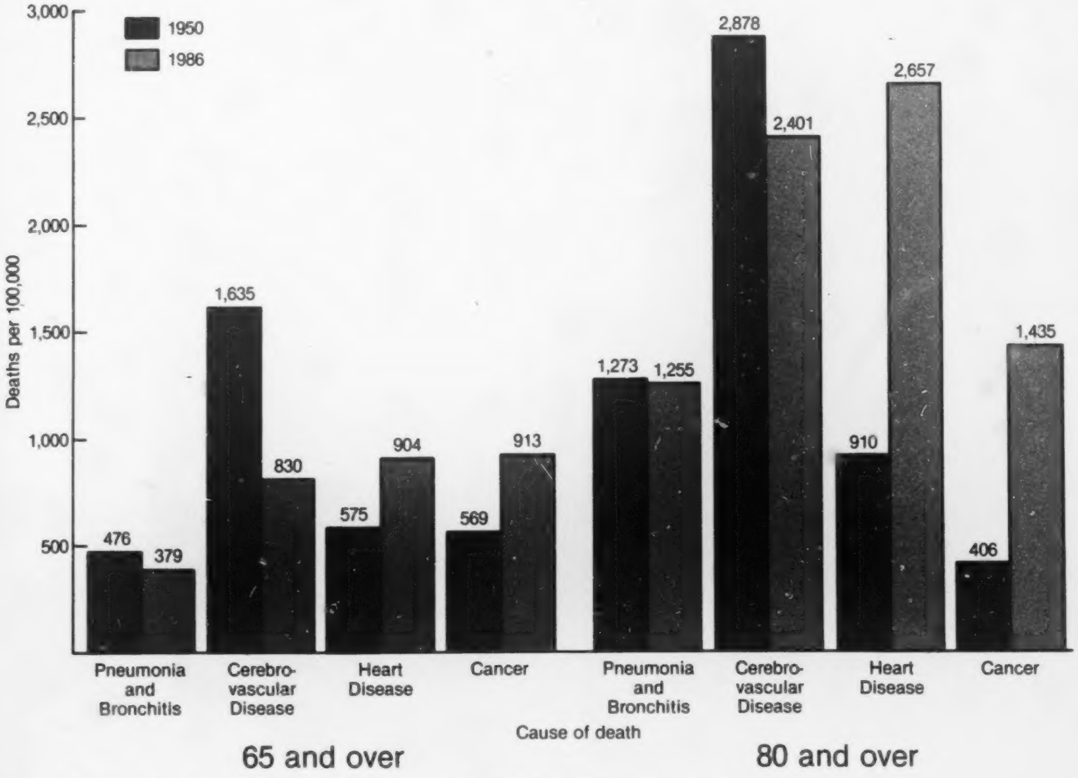
More important for future population aging in Japan will be the course of mortality, not fertility. The government's projections assume an increase in the expectation of life at birth from 74.8 to 77.9 years for males and 80.5 to 83.8 for females between 1985 and 2025. However, in the 1980s, mortality decline progressed faster than expected in Japan and government projections made in the 1970s were based on mortality levels already considered to be too high.

Japan has entered what is considered the fourth stage of the epidemiologic transition*, the stage of delay of the onset of degenerative diseases.[9] Since World War II, the main causes of death have shifted from respiratory diseases, such as tuberculosis, pneumonia, and bronchitis to the chronic degenerative diseases—cancer, heart disease, and cerebrovascular disease. Further declines in mortality are not likely to result from changes in the major causes of deaths, but rather in shifting the risk of dying from these degenerative diseases to older ages.

In most developed countries, heart disease is the number-one killer, followed by cancer and cerebrovascular disease. Japan's cause-of-death pattern is different, as shown in Table 2. Between 1958 and 1980, the order was cerebrovascular disease, cancer, and heart disease. In 1981, cancer became the top cause of death, and in 1985, heart disease gained second place.

This pattern for the overall population is reflected in the older population also (see Figure 2). After 1984, the most important cause of death among those 65

Figure 2. Major Causes of Death Among the Elderly: Population 65 and Over, and 80 and Over, Japan, 1950 and 1986



Source: Japan Ministry of Health and Welfare, *Vital Statistics 1986*, Vol. 1 (Tokyo, 1987).

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*The first stage of the epidemiologic transition is the age of epidemics and famines; the second is the period when mortality from infectious and parasitic diseases declines; the third is the era of degenerative diseases, such as cancer and heart disease.

and over shifted from cerebrovascular disease to cancer with heart disease a very close second. Among the 80 and over population, however, heart disease is number one, followed by cerebrovascular disease and cancer.

Until the 1960s, "senility," which then was often used as a catchall category for ill-defined causes, was the most important cause of death in the 80 and over group and ranked second in the 65 and over group. Today senility is more precisely diagnosed by physicians (although the diagnosis can be confirmed only at autopsy) and is the fifth-ranked cause of death for those 65 and over. Consequently, some of the changes shown in Figure 2 reflect improved diagnosis of causes of death in recent decades.

Contrary to a popular belief among some non-Japanese, suicide is not a major cause of death among the elderly in Japan, and it is *relatively* important only at younger ages where overall mortality is low (see Box 1).

After adjusting for differences in national age compositions, Japan has the lowest death rates from ischemic heart disease and cancer, but the highest rate from cerebrovascular disease of all the countries listed in Table 2. The differences between the Japanese and other developed countries' patterns and the recent changes in the Japanese causes of death are frequently attributed to differences in diet and lifestyle.[10] The decline in the consumption of salt, which was high in the traditional Japanese diet of rice, salted vegetables, and fish, and the improvement of home heating are said to have reduced cerebrovascular disease. At the same time, this traditional diet, which is low in animal protein and dairy products, is considered a factor in the relatively low incidence of heart disease in Japan.

Despite the relatively low cancer death rate, there is concern about the continuing increase in cancer deaths even within the elderly population itself. Of particular concern is the rising incidence of cancers associated with smoking, especially among males. In the 75 and over group, Japan has a higher death rate for cancers of the trachea, lung, and bronchus than do France and Sweden.

There is an active anti-smoking campaign in Japan, although it is not yet so strong as in the United States. The Japanese Ministry of Health and Welfare is encouraging anti-smoking measures, such as the recent banning of smoking in Tokyo subway stations. The ministry itself has gone only so far as to ban smoking in its meetings, set up smoking corners in its waiting rooms, and attach health warnings to the cigarette machines in its buildings.[11]

The percentage of Japanese males over age 20 who smoke has declined from about 70 to 60 percent in the 1980s, while the percentage of adult females who smoke has fluctuated between 12 and 15 percent,[12] but it will take time before any decrease in smoking is manifested in lower lung cancer rates.

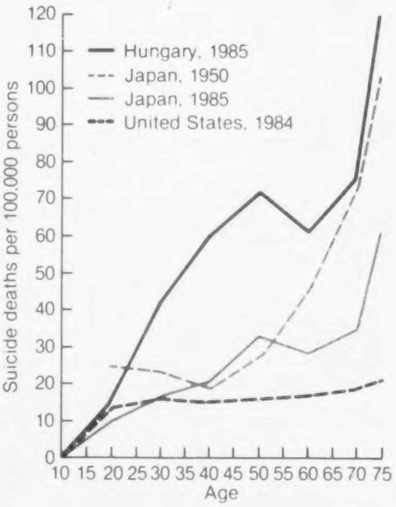
Overall, however, life expectancy and health have demonstrated remarkable improvements in Japan. As mortality has declined throughout the 20th century, the members of each birth cohort have had a greater chance of surviving to any given age than did earlier cohorts. For example, a Japanese woman born in 1900 had a probability of 0.39 (or a 39 percent chance) of living to age 65, but a woman born in 1920 had a 0.55 probability of reaching 65. If survival to the oldest ages continues to improve, the aging of the Japanese population may be even greater than the government has projected.

If the Japanese continue to lower their mortality and raise their life expectancy, will they be healthier and have better as well as longer lives? This question is important to Japan and to all nations, especially with regard to providing medical care and household services for the elderly in need.

There is a common perception in Japan today that Japanese elderly are more likely to be bedridden than elderly in other developed countries, but there is

Box 1. Suicide

Suicide Death Rates by Age for Japan, 1950 and 1985, Hungary, 1985, and the United States, 1984



Sources: Japan—Japan Ministry of Health and Welfare, *Vital Statistics 1986*, Vol. 1 (Tokyo, 1987); Hungary—World Health Organization, *1986 World Health Statistics Annual* (Geneva, 1986); United States—World Health Organization, *1987 World Health Statistics Annual* (Geneva, 1987).

In 1988, the morning after the national holiday, Respect for the Aged Day, the *Japan Times* carried on page two an article with the following headline: Suicides of Three Elderly Mar Holiday Honoring Aged. One woman, aged 81, who hung herself from a bridge, was believed to have been exhausted from caring for her 86-year-old husband, who had been bedridden for 20 years. Another woman, aged 63, jumped from the seventh floor of a hospital where for two years she had been staying for treatment for Parkinson's disease. A man aged 85, hanged himself in a park and was supposedly despondent because of illness. Given the very public nature of these deaths, were these individuals making a statement about the plight of Japanese elderly?

Traditional Japanese culture has been more tolerant of suicide than Western culture. However, the incidence of suicide in Japan has declined in the postwar period, and the suicide rate in 1985 of 19.4 per 100,000 was lower than that of France, Denmark, and West Germany, though higher than that of Australia, Canada, England and Wales, Iceland, Sweden, and the United States.

In Japan, as in many developed countries, the suicide rate increases with age, as shown in the figure. This pattern is particularly marked in Hungary, the country with the highest reported suicide rate. However, Japan has experienced a decline in old-age suicide rates in the post-World War II period. Japan shares another characteristic of suicide common in other developed countries: Males are more than twice as likely to commit suicide as females. But this sex differential declines among the elderly. In 1985, the suicide rate of Japanese females of all ages was 50 percent of that for males, but for ages 65 and over, it was 70 percent. Among Western countries, only Hungarian females ages 65 and over have a higher suicide rate than older Japanese females—56 versus 39 per 100,000. Among the three other East Asian countries with death rates by cause published by the World Health Organization, Hong Kong and Singapore have comparable suicide rates for older women. The 1985 rate for South Korea is much lower—11 per 100,000 women ages 65 and over.

Although the causes of suicides cannot always be known precisely, the National Police Agency reports that of those 60 and over who killed themselves in 1987, over 70 percent did so because of ill health. In 1978, elderly in Tokyo who were living alone had a lower rate of suicide than those living with their children and grandchildren, perhaps indicating that the stress for those living in a multigenerational household is no less than for those living alone.[1]

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1. Ueno, Masahiko, Munesuke Shoji, Masahiro Asakawa, Masae Ohrui, Toru Kogure, Koichi Minekawa, Toshiji Makai, Setsuyo Nagasawa, Genichi Matsuzaki, and Masami Washino, "Suicide Among Elderly People Based on Records of the Tokyo Medical Examiner's Office," *Nihon University Journal of Medicine*, Vol. 40, No. 10 (October 1981; in Japanese) pp. 1109-1119.

no hard evidence. In 1981, among those ages 80 and over in Japan, about one in ten were bedridden.[13] The fear of senility has particularly captured the attention of the Japanese (see Box 2). Daisaku Maeda, a leading Japanese gerontologist, and his collegues argue that because Japan, compared to most other

Box 2. Senile Dementia

Kookotsu no Hito (A Man in Ecstasy), Japan's best-selling novel of 1972, brought the issues of senile dementia and aging to the forefront of public debate. The book, which inspired a first-run movie, was published in English as *The Twilight Years*. The novel tells the story of a middle-aged working woman who rises to the challenge of taking care of her recently widowed father-in-law, who is becoming progressively more senile.

Senile dementia, a form of organic brain syndrome, affects only about 4.5 percent of the non-institutionalized 65 and over urban population, which is probably less than in other developed countries. Also in Japan, fewer cases are of the Alzheimer's type and more are of a vascular nature, consistent with the importance of cerebrovascular disease in Japan.[1] Nevertheless, senility represents the worst fears about aging among the Japanese. A *Japan Times* editorial of July 1, 1983, states, "The problem of the aged, so-called, should be redefined as the problem of the senile."

Of greatest concern is the stress placed on families, especially wives and daughters-in-law, as depicted in *The Twilight Years*. Besides suffering the problems of disorientation and mindless wandering, elderly with senile dementia are also more likely to be bedridden, thus requiring greater care than the average elderly person. A 1987 Tokyo Metropolitan Government study of care-givers of the demented elderly found that 78 percent suffered anxiety about their own health, 76 percent mentioned mental exhaustion, and 61 percent expressed a desire to place the elderly person in an institution.[2] In fact, there is some evidence that an increasing proportion of the demented elderly with senile dementia are being placed in institutions,[3] a trend very much in conflict with traditional Japanese values of filial piety.

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1. Maeda, Daisaku, R. Teshima, H. Sugisawa, and Y.S. Asakura, "Aging and Health in Japan," *Journal of Cross-Cultural Gerontology*, Vol. 4, No. 2 (in press).
2. Ibid.
3. "Tokyo's Senility Cases at Home Show Rise, But Percentage Drops from 1980 Survey," *Japan Times* (May 28, 1988) p. 2.

developed countries, has relatively more stroke victims, who often require long convalescent periods, there may be greater disability among elderly Japanese. They also note that rehabilitation services in Japan are relatively poor. Furthermore, more Japanese live with their children, possibly removing an incentive for the disabled elderly to recover independence.

Family Relations

Marital Status

The family situation of the elderly is also influenced by mortality. A majority (59 percent) of Japanese females ages 65 and over are widows, while a majority of males (82 percent) are married. As shown in Figure 3, widowhood increases substantially with age for both men and women. Because women live an average of six years longer than men and most elderly women are three to four years younger than their husbands, a majority of women outlive their husbands.

Elderly men are much more likely to remarry than women. The excess of women at older ages is the most obvious reason for this difference. But, there are also cultural reasons why women may be reluctant to remarry. While there are no specific secular or religious proscriptions against remarriage of women, there is some sense that a widow should remain loyal to her deceased husband.

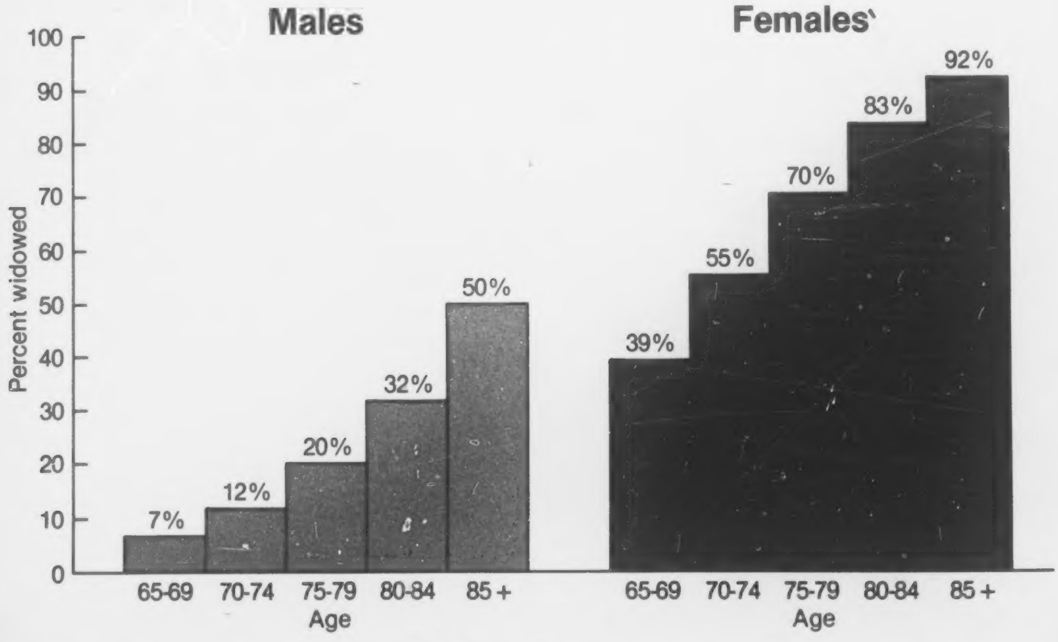
Most older widows (and widowers) in Japan today have experienced only arranged marriages. In 1988, two-thirds of currently married women ages 60 and over were in arranged marriages, compared to only one-third of married women in their 30s, according to a 1988 *Mainichi Newspaper* and Nihon University national survey. The survey also revealed that the elderly, particularly older women, find the idea of remarriage less attractive than do younger persons, although age may account for a part of this difference in attitudes among the generations. Seventy percent of men and 64 percent of women in their 20s said that they would like to remarry if they became single in old age. Among the 60 and over population, however, only 25 percent of men and 9 percent of women responded positively.

Besides the shortage of eligible older males and the social stigma attached to remarriage, some older women experience a sense of relief at the loss of their husbands and are not eager to marry again. Given the strong sexual division of labor in Japan in which in theory the woman controls all aspects of the household, including finance, and the man is in charge of the outside world, the extended period of retirement of Japanese males and longer life expectancy have placed considerable strain on marriages of long duration.[14]

Many older Japanese men have not developed interests outside work and almost all expect to be waited upon and have someone with them when at home. Consequently, they are very dependent on their wives after retirement. In the popular Japanese media these retired men have become known as *sodaigomi* or "big trash," which has even more negative connotations than the American term "couch potato."

Takie Lebra, a Japanese-American anthropologist, has noted, "Some elderly women, still married, envy their widowed peers."[15] The proportion of divorces that occur after at least ten years of marriage increased from 24 percent in 1970 to 44 percent in 1986. The proportion of divorces occurring after 20 years increased from 5 to 13 percent over the same period.[16] Although some of this change is due to the aging of the population, it may also reflect an increase in marital stress among older retired couples.

Figure 3. Widowhood by Age for Males and Females: Japan, 1985



Source: Japan Statistics Bureau, *1985 Population Census of Japan*, Vol. 2, Part 1 (Tokyo, 1986) p. 62.

Multigenerational Households

The decline in mortality in the 20th century has lengthened the number of years that parents and their adult children are alive at the same time. Given this change, an increase in the percentage of elderly parents who live with their adult children might be expected, if past preferences persisted and there were no new constraints on living arrangements. In fact, just the opposite has been the case.

In the traditional stem-family structure, the eldest son brings his wife into his parents' home when he marries. The two generations live together until the parents' deaths, and the son inherits his parent's assets. Daughters and younger sons form their own households. If there is no son, the oldest daughter's husband may be adopted into the family and he plays the role of the eldest son. This pattern of postnuptial residence has weakened in recent years. Of eldest sons who married in 1960-64, 58 percent lived with their parents after marriage, whereas for the eldest sons who married in 1980-82, only 41 percent resided with parents.[17]

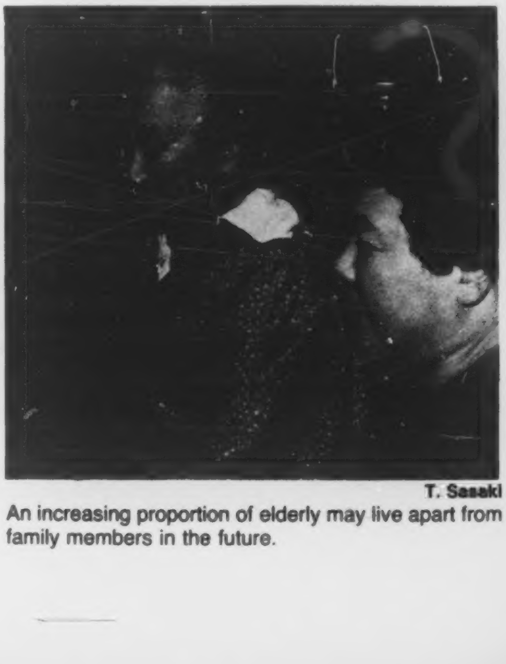
Similarly, the percentage of the elderly living with adult children has declined sharply in recent decades, as shown in Figure 4. Between 1970 and 1985, the percentage of the noninstitutional population ages 65 and over living with children fell from over three-quarters (77 percent) to less than two-thirds (65 percent). Instead, more and more elderly live with their spouse only or alone.

The living arrangements of elderly individuals vary according to marital status, sex, age, and type of residential community.[18] Not surprisingly, widowed or divorced elderly are more likely to live with their children than are those who are still married. Women are less likely than men to live with their spouse only, and more likely to live with children or alone. Living alone increases with age initially, probably reflecting the rise in widowhood as the elderly age, but this trend is reversed at very old ages. In 1985, the percentage of elderly living alone peaked at ages 70-74. The elderly living in cities—about 70 percent of the 65-and-over population—are less likely to live with their children and more likely to live with a spouse or alone.

Only about 5 percent of the 65-and-over population were not living in an ordinary household at the time of the 1985 census: 2.6 percent were in a hospital, 1.6 percent in an institution, and 0.4 percent in a boarding house or some other setting.

In most Asian countries, about three-quarters of the elderly live with their children, about the same percentage as in Japan in 1970.[19] In the United States, however, more elderly live alone or with their spouses. In 1987, over 30 percent of the noninstitutionalized American population over age 65 lived alone. Only about 5 percent of the American elderly reside in nursing homes.[20]

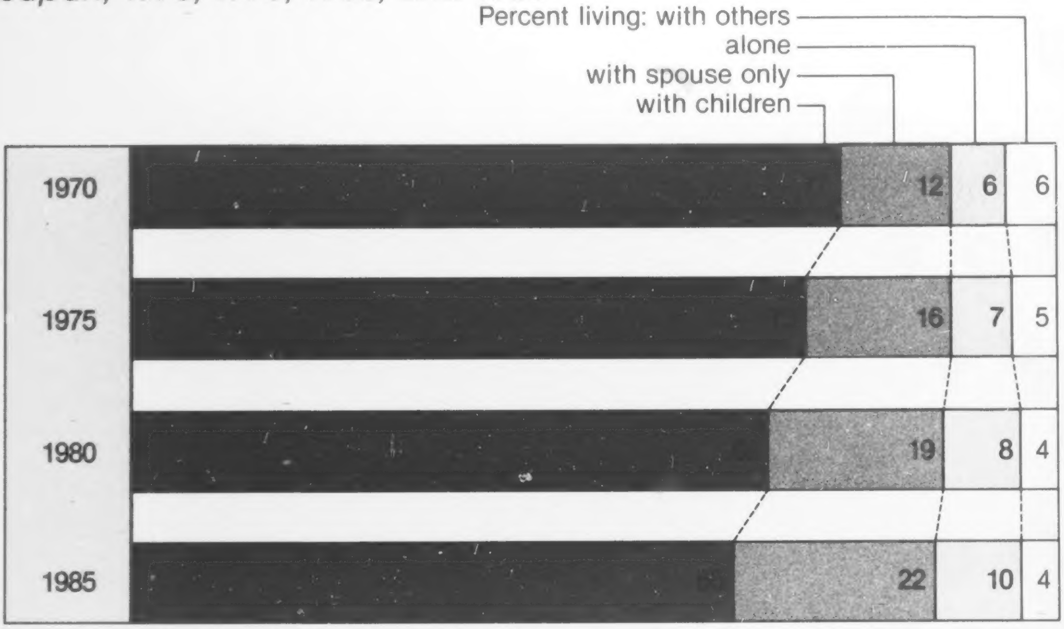
The decline in the percentage of Japanese elderly living with their children may simply represent a *delay* in co-residence, perhaps until the elderly person is widowed or frail. Nevertheless, cohort trends in living alone and in non-ordinary households indicate that an increasing proportion of the elderly of all ages will



T. Sasaki

An increasing proportion of elderly may live apart from family members in the future.

Figure 4. Living Arrangements of the Population 65 and Over: Japan, 1970, 1975, 1980, and 1985*



*Population living in ordinary (noninstitutional) households

Source: Japan Statistics Bureau, *Population Census of Japan*, 1970, 1975, 1980, and 1985 (Tokyo).

live apart from family members in the future. For example, only 9.6 percent of the women born between 1900 and 1905 lived apart from their families when they were ages 65 to 69 in 1970. By 1985, however, when they were ages 75 to 80, the percentage had doubled to 19.3.

Attitudes about Family Support

Young and old Japanese alike appear to be less certain about a child's obligations to support aging parents. Although support is not necessarily equivalent to coresidence, these changing attitudes may point to further declines in the percentage of elderly living with children. The *Mainichi Newspaper*'s biennial surveys of wives of childbearing ages show that the proportion planning to depend on their children in old age has declined from 55 percent in 1950 to 18 percent in 1988. Similarly, the proportion indicating that it is a good custom or natural for children to take care of their elderly parents has declined from 75 percent in 1963 to 63 percent in 1988.[21] In particular, the role of the eldest son is no longer clear. A 1988 survey indicated that only 32 percent of all adults thought it is the eldest son's duty to look after his parents, compared to 47 percent of those 60 and older who thought so.[22]

Nevertheless, the majority of Japanese elderly today still prefer living with their children. As shown in Table 3, a 1986 Japanese government-sponsored survey of persons ages 60 and over in five countries found that 58 percent of Japanese and 66 percent of Thais thought it best for the older and younger generations to live together, in contrast to 34 percent of Italians, 4 percent of Danes, and 3 percent of Americans. The relationship considered best in the three Western countries was living separately, but with meetings to eat and talk together, a pattern sometimes referred to

Table 3. Best Relationship Between Younger and Older Family Members According to Persons Ages 60 and Over: Selected Countries, 1986

	Japan	Thailand	Italy	Denmark	United States
Percent saying best relationship is:					
Live together	58.0%	65.9%	33.6%	3.8%	2.7%
Meet to eat and talk	39.5	31.3	65.0	92.0	95.5
Have no contact	1.5	1.6	1.0	0.2	0.3

Source: Japan Management and Coordination Agency, *Report on the International Comparative Survey on the Lives and Perceptions of the Elderly* (Tokyo, 1987; in Japanese) pp. 270-271.

as intimacy at a distance.

There were also substantial differences in the elderly person's desired care-provider in the event they became physically weak. Table 4 shows that between 88 and 96 percent of elderly Japanese, Thais, and Italians wanted to have family members care for them, whereas only 69 percent of Americans and 20 percent of Danes chose family members.

Just over half of elderly Japanese (51 percent) said that they would want their spouses to take care of them. Significantly, only 24 percent of females named their spouses, compared to 65 percent of males. The care-giver most favored by elderly women was a daughter-in-law—preferred by 29 percent—which is what one would expect within the traditional stem family. Even

Table 4. Preferred Care-Giver If Become Physically Weak According to Persons Ages 60 and Over: Selected Countries, 1986

	Japan	Thailand	Italy	Denmark	United States
Percent who prefer:					
Family	95	96	88	20	69
Spouse	*51*	*18*	*38*	*13*	*36*
Son	*12*	*26*	*13*	*1*	*6*
Daughter	*14*	*42*	*28*	*4*	*18*
Daughter-in-law	*16*	*1*	*3*	*1*	*1*
Son-in-law	*z*	*1*	*z*	*z*	*z*
Sibling	*1*	*3*	*4*	*1*	*5*
Other	*1*	*6*	*3*	*z*	*3*
Neighbor or friend	3	6	7	1	18
Community group	5	1	9	2	15
Public agency	15	9	14	30	9
Private agency	5	1	6	39	41
Other/No answer	1	1	2	10	9

Note that multiple responses to major categories are allowed; only the first-choice family member is indicated for those who chose family as one of the major categories.

z = less than 0.5 percent

Source: Japan Management and Coordination Agency, *Report on the International Comparative Survey on the Lives and Perceptions of the Elderly* (Tokyo, 1987; in Japanese) pp. 292-295 so, almost as many (23 percent) said they wanted their own daughters to take care of them—a significant departure from the ideal.

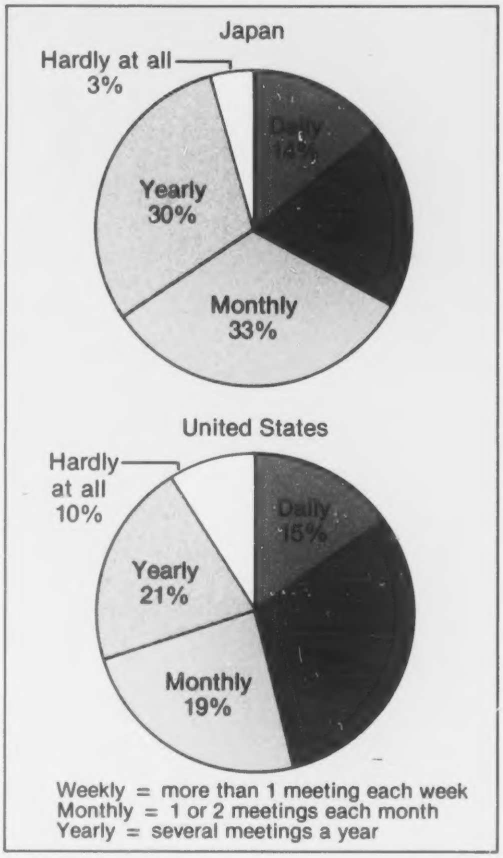
The expressed willingness of family members to care for the elderly also differs considerably across cultures. For example, a study in the late 1970s found that 90 percent of Japanese would take care of an older woman if she were the person's mother, but only 19 percent would care for an elderly aunt and 8 percent for an elderly friend. In contrast, 84 percent of Americans would care for an older mother, 69 percent for an aunt, and 52 percent for an elderly friend.[23] Americans and Japanese revealed similar differences regarding care for an elderly man. Thus, a sense of obligation toward the elderly in America applies to a wider array of individuals than in Japan, including friends as well as family.

Contact with Children

Japanese and American elderly persons also report differences in the frequency of contact with adult children and in the perception of their children's interest in their well-being. As shown in Figure 5, about 15 percent of each group report that they meet almost every day with children with whom they do not live, but 36 percent of Americans report meetings of at least once a week, while only 19 percent of Japanese do.

On the other hand, a larger percentage of American than Japanese elderly reported having hardly any contact with their adult children who live apart from them. Nevertheless, the same survey found that 84 percent of Americans reported that their children were very interested in their well-being, whereas only 67 percent of Japanese did so. Thus, although many more elderly Japanese than Americans live with their adult offspring, the intimacy at a distance, which American elderly prefer and apparently have, seems to leave them feeling of greater importance to their children.

Figure 5. Frequency of Visits with Adult Children by Japanese and Americans Ages 60 and Over, 1986*



*Children with whom the respondents did not live.

Source: Japan Management and Coordination Agency, *Report on the International Comparative Survey on the Lives and Perceptions of the Elderly* (Tokyo, 1987; in Japanese) pp. 268-269.

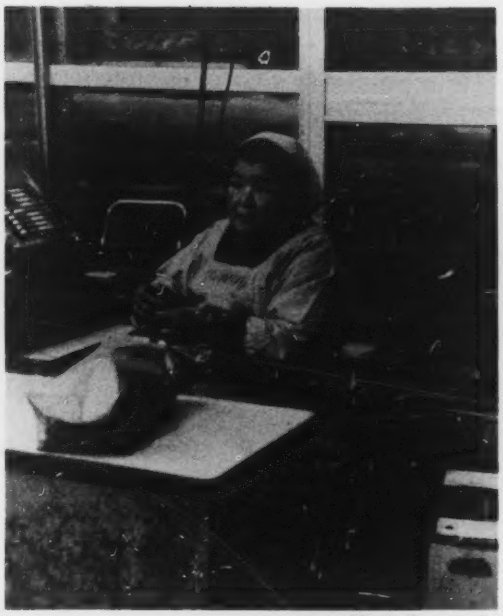
Incentives for Family Support

As mentioned earlier, in the ideal Japanese stem-family system, the eldest son was expected to inherit all his father's assets. Under the American occupation after World War II, the Japanese constitution was revised to specify that if there is no will, a surviving wife would receive one-half of the assets and that the rest (with the exception of farmland) would be divided equally among all children. A will can specify some other division for half the assets, but the rest must be divided as indicated above. Nevertheless, shares may be renounced, and more than twice as many women as men do so.[24] Renunciation of inheritance is sometimes used to ensure that the bulk of the family estate goes to the child who promises to care for a surviving parent.

Using inheritance as compensation for services rendered is gaining popularity in Japan, the biennial *Mainichi Newspaper* family planning surveys indicate. In 1963, 18 percent of wives of childbearing age said that they would leave their property to the children who took care of them and their husbands; by 1977, the percentage giving this answer had increased to 32. Support for compensatory inheritance is most popular among women, the more educated, and those living in urban areas. Income tax credits for taking care of an elderly parent and government loans for home remodeling or building to care for an elderly person also provide some incentives for caregivers, although the amounts involved are relatively small.[25]

Work, Retirement, and Economic Well-Being

Many Japanese elderly can support themselves. In fact, as a group, they are more likely to work than the elderly in any other developed country.[26] In 1987, 36 percent of males and 15 percent of females age 65 and over were in the labor force in Japan. In the same year, only 16 percent of older men and 7 percent of older women were in the U.S. labor force.[27] Nevertheless, the percentage of older Japanese who work has declined over the last few decades as the labor force has moved out of agriculture and as public pensions have improved.



Diane Gruenstein

Compared to other developed countries, a high proportion of Japan's elderly continue to work.

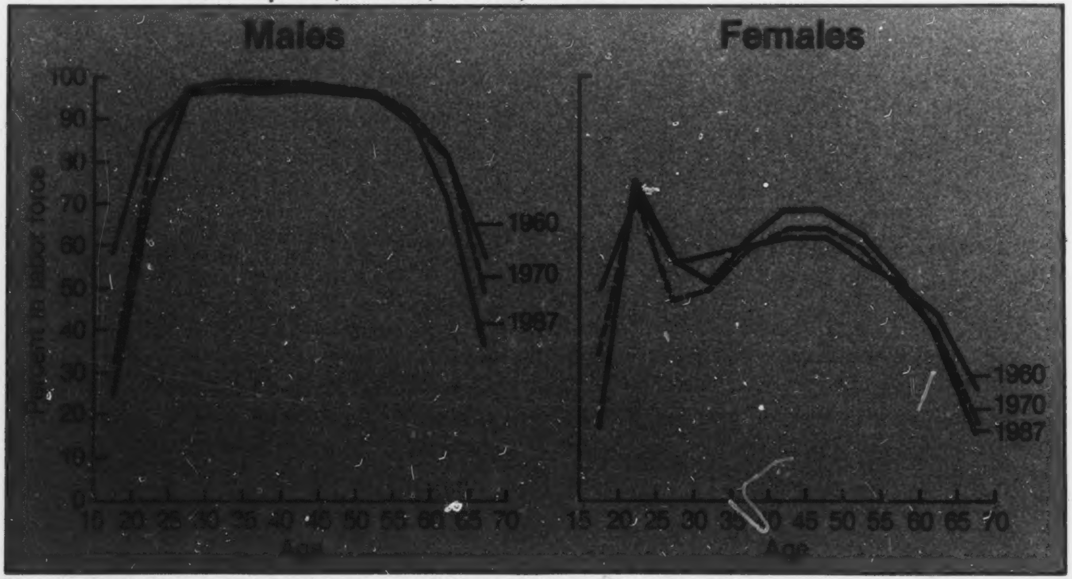
The pattern of male labor force rates by age and the decline in work activity for both sexes at the youngest and oldest ages, shown in Figure 6, are typical of developed countries. For 1960, 1970, and 1987, the rates for males are uniformly high in the prime working ages, while rates at the extremes of the age distribution are lower and have declined over time. The percentage of young people who work has declined because Japanese youth are spending more years in school. In 1960, less than 60 percent of lower secondary school graduates advanced to high school, while in 1986 over 94 percent did. Similarly, the percentage advancing from high school to higher education increased from 20 to 26 percent for males and from 14 to 34 percent for females.[28]

The pattern of female participation rates by age has an M-shape, which is not typical of most other developed countries. Until recently, Japanese women were expected to leave paid employment when they got married or when their first child was born. Some women reentered the labor force after raising their children, thereby creating the second peak of the M. Rates have declined over time at the extremes of the age distribution, but the middle ages have a mixed pattern. From the 1950s until the mid-1970s, the female labor force participation rate fell as the incidence of unpaid family work declined. Since then, however, the increasing number of women who are paid employees has outweighed this decline, and the female labor force participation rate has increased overall. In 1985, the Diet passed an Equal Employment Opportunity Law to address the broad range of discrimination against women in hiring, wages, promotion, and retirement, but it is too soon to tell how effective it will be.

Another important development in the Japanese work force is the growing importance of part-time work (less than 35 hours per week). The highly publicized "lifetime employment" system of Japan actually applies only to a limited number of men who work for large companies. In recent years, when employers needed to hire workers, but were uncertain about the economic future and wanted to avoid having to pay full benefits and making a commitment to new lifetime employees, they have hired part-time workers. Women and the elderly have filled many of these positions. The proportion of part-timers among employees of firms with five or more employees grew from 3 to 9 percent between 1975 and 1986.[29] Almost a third of all women, over half of women over age 65, and over a third of men over age 65 who were employed in 1987, were working part-time.

The elderly tend to work at different types of jobs than younger workers. Many older people work in the primary sector where retirement is more at the discretion of the individual. In 1987, over one-third of elderly men were working in agriculture, fisheries, and forestry, compared to only 5 percent of the 40-54-year-old men and 17 percent of the men

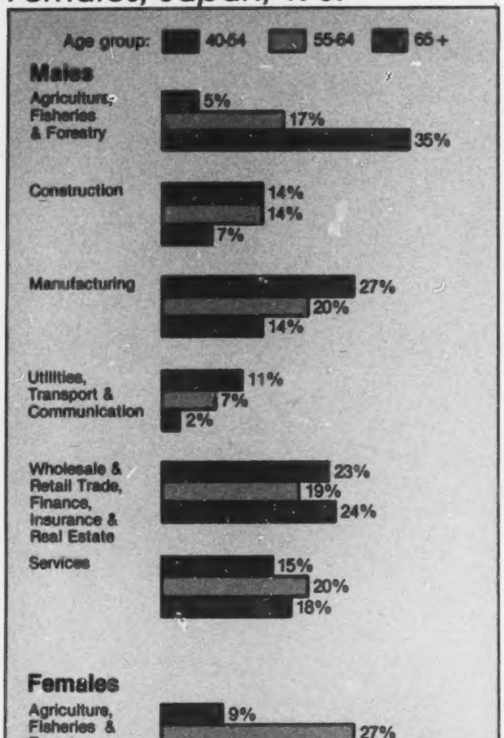
Figure 6. Labor Force Participation Rates by Age for Males and Females: Japan, 1960, 1970, and 1987*



*The rate equals the percentage of persons working or seeking work within each age group.

Source: Japan Statistics Bureau, *Annual Reports on the Labour Force Survey*, 1987 and 1970 (Tokyo, 1988 and 1981).

Figure 7. Selected Age Groups of Workers by Major Industry: Males and Females, Japan, 1987



Source: Japan Statistics Bureau, *Annual Report on the Labour Force Survey*, 1987 (Tokyo, 1988).

ages 55-64, as shown in Figure 7. The percentage of women in the primary sector also increases with age.

Conversely, the importance of construction, manufacturing, and the utilities, transportation, and communication industries all decline with age for both men and women. The service industry, wholesale and retail trade, finance, insurance, and real estate are important employers of elderly workers. About 42 percent of males and 47 percent of females 65 and older worked in one of these industries in 1987.

There is debate about the reasons for the relatively high labor force participation of the Japanese elderly. Besides the relative importance of the primary sector in Japan, some point to the fact that until recently public pension benefits were meager and not universally available. Others have attributed the high participation to Japan's strong work ethic and work-group orientation.[30] The government-sponsored 1986 cross-national study of the elderly indicated that of those working, over 90 percent of Americans and Japanese said that they wanted to continue working (though the percentage of Japanese actually working was twice that of the Americans). Forty-two percent of the Japanese, but only 18 percent of Americans who wanted to continue working cited health reasons. Just over one-third of both Japanese and Americans (39 and 37 percent, respectively) worked primarily to earn income, but far fewer Japanese than Americans (8 versus 41 percent) said they worked for the enjoyment of it. Thus, financial considerations played relatively equal roles across countries, but the non-financial reasons given were quite different. Japanese expressed concern about health, while Americans emphasized their enjoyment.

Elderly Americans also place more emphasis on enjoyment as a reason for *not* wanting to continue working. Of those wanting to quit, 83 percent of Americans cited wanting to enjoy a leisurely life, while only 54 percent of Japanese did so.

T. Sasaki

Many Japanese elderly work in the primary sector, the fishing industry, for example, where retirement is more at the discretion of the individual.

Japanese were five times as likely as Americans to mention poor health as the reason for wanting to quit (31 versus 6 percent, respectively). Nevertheless, the desire for a leisurely retirement seems to be growing in Japan (see Box 3), just as it is in the United States. In a similar 1981 survey, only 46 percent of Japanese and 72 percent of Americans who wanted to retire said it was to enjoy their leisure.

Lifetime Employment and Mandatory Retirement

For elderly Japanese who want to continue working in the nonagricultural sector, considerable effort and sacrifice may be required. The famed Japanese lifetime employment system excludes a large proportion of the labor force. Furthermore, relatively low mandatory retirement ages, combined with high life expectancy, imply a lengthy retirement life of up to 20 years.

In 1987, there were 60.8 million Japanese in the labor force of which 59.1 million were working. Only 39.4 million or 65 percent of the total labor force were "regular" employees or workers who might be eligible for lifetime employment. Excluding the female regular employees, whose careers are usually interrupted, only 26.5 million employees were likely to have the benefits of lifetime employment[31]—less than half of the Japanese labor force.

The lifetime employment system was instituted between the two world wars when there was a shortage of labor and a need to ensure company loyalty—especially among skilled workers that a company had trained. Under the system, a worker joins a company upon graduation from school at a starting salary based on his education and sex and on the size of firm. Salary increases are a function of longevity, although there are also allowances for dependents and special duty. In addition, there is overtime pay at a rate of 1.25 times base pay and there are usually bonuses twice a year based on the monthly wage. In 1986, the average combined bonuses for workers were the equivalent of about

Box 3. Leisure

Although over 40 percent of the 60-and-over population ostensibly belongs to senior citizens' clubs,[1] elderly Japanese seem to be somewhat at a loss about what to do with their leisure time. Even allowing for the fact that about twice as many work as in the United States, American elderly are much more involved with hobbies and activities outside the home. The 1986 crossnational survey of persons 60 and over found that the percentage of Americans involved *frequently* in clubs or hobby groups was almost five times as great as the percentage of Japanese (26.4 versus 5.6 percent). The ratio of Americans to Japanese involved in religious activities was over 8, attending social gatherings over 20, engaging in sports nearly 4, and serving as community volunteers or being active in senior day centers about 2.

Also indicative of the degree of social integration in old age is the finding that the Japanese have fewer friendly chats with people in their neighborhoods. Almost 50 percent of Thais and almost 40 percent of Americans, Italians, and Danes reported daily conversations with neighbors, while less than 20 percent of Japanese did so. Close to one-third of elderly Japanese reported hardly any neighborhood contact, in contrast to only 7 percent of Americans.

However, it is likely that the retirees of the future will have had more experience in leisure activities prior to old age than the current generation of Japanese elderly. Japan is gradually moving toward a five-day work week from the standard five-and-a-half-day week. Furthermore, in 1987 the Labor Standards Law was revised to provide guidelines for the maximum hours to be worked each week without overtime pay, although the implementation of the guidelines will be at the discretion of the Ministry of Labor. The revised law also makes it illegal to punish workers who take their full entitlement of vacation days.

One motivation for reducing hours of work is to increase domestic consumption and thus reduce the trade surplus. Another is the sense that the Japanese quality of life has not kept pace with economic growth and that it is time for the Japanese to enjoy more of the fruits of their labor, as citizens of other developed countries have. Nevertheless, some firms are resisting the reduction of working hours because they have relied on the flexibility in working hours to adjust to changes in economic conditions, rather than hiring and firing lifetime employees. There is also some concern that the *shinjinrui* or new human race of young people, who have been born into affluence, might begin to take leisure too seriously, but the slow pace of change thus far should quiet those fears.[2]

In 1986, 28 percent of workers in firms with 30 or more employees were working only 5 days a week—up from 21 percent in 1975. About half the workers—if not enjoying a five-day work week—at least were taking off one to three Saturdays per month.[3] Similarly, the "enforcement" rate for summer vacations (the proportion of firms *requiring* workers to take their summer holidays) increased from 72 to 80 percent between 1980 and 1986, but the average number of days off remains small—only 3.3. Including national and other holidays, the average annual number of days off increased only from 16.8 to 17.4 days over the 6-year period. Futhermore, total hours worked, including overtime, have not changed significantly in the 1980s.

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3. Japan Institute of Labour, *1988 Japanese Working Life Profile: Statistical Aspects* (Tokyo: 1988) pp. 39-42.

three-and-a-half months' wages.[32] In return, the worker is expected to stay with the same firm throughout his career, to undergo considerable on-the-job training, and to do whatever jobs are asked of him.

The catch to all this security for the chosen workers is that until recently it usually ended at age 55. Table 5 shows the age limits of firms with 30 or more employees and uniform* mandatory retirement systems between 1968 and 1987. In 1968, nearly 64 percent of firms with uniform systems required that employees retire at age 55 or younger.

When the lifetime system was first instituted, age 55 was consistent with life expectancy, so it was a reasonable age limit. But in the 1970s, with higher life expectancy and aging of the population, the Japan Ministry of Labor began to pressure companies to raise the age limits. (See Box 4 for a review of Japanese employment policies for older workers.) By 1987, over half the firms were specifying 60 years as the age limit. Also, the percentage of firms with uniform systems grew from 51 to 80 percent. Unlike the United States, Japan has no general law with regard to mandatory retirement or the age limit, and only in the 1980s have sex differences in mandatory retirement—forcing women to retire earlier than men—been ruled illegal.

Retirement Allowances

In 1985, 89 percent of firms with 30 or more employees gave retirement allowances—over half of these firms gave lump-sum payments only, while 14 percent gave pensions, and the rest gave a mix of the two, often leaving the choice to the employee. The type of retirement allowances available to employees has changed considerably in recent years. In 1966, most (over 85 percent) were in the form of lump-sum payments, almost none were pension schemes, and about 13 percent offered a combination.[33] Since that time pension plans have become more popular because tax advantages for pension funds held outside firms have been instituted, and because pensions also allow employers to spread out payments to retirees. However, private pensions are not for the lifetime of the employee, but for a fixed period, usually about ten years. The average value of the retirement allowance ends up being more or less the same, no matter what the form. Many Japanese workers prefer the lump-sum option because

Table 5. Retirement System and Age Limit in Firms with 30 or More Employees: Japan, Selected Years

	1968	1974	1980	1987
Percent of firms with age limit	69	67	82	89
Percent of firms with uniform system	51	44	60	80
Age limit in firms with uniform system (percent)				
< 55 years	0.3	0.3	0.2	0.3
55	63.2	52.0	39.5	23.0
56-59	14.2	12.3	20.1	18.0
60	22.3*	32.4	36.5	53.9
61-64		0.4	0.7	2.3
65+		2.6	2.5	2.5
Total	100.0	100.0	100.0	100.0

*60 and over

Note: A *uniform system* means that there are no differences on the basis of occupation or sex.

Source: Japan Ministry of Labour, *Employment and Management Survey*, various years.

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*A *uniform* retirement system does not differentiate by sex or occupation.

they may have very specific plans for its use, there are tax advantages to taking the lump sum, and they may have doubts about the pension maintaining its value.

The amount of the retirement allowance is based on years of service, occupation, education, sex, and the last basic monthly salary. In 1985, the average retirement allowance for a male high-school graduate in an administrative, clerical, or technical job with 35 or more years of service was equal to about 4 years' worth of his last basic monthly pay.

Given the link between salary increases and longevity in the seniority-wage system and between retirement allowance and length of service and last salary, many firms have been reluctant to raise the age limit. But government and social pressure to do so has been strong. In fact, at the same time that some firms have raised their age limits, they have adjusted their formula for calculating retirement allowances to minimize the extra cost of keeping on the older workers.[34] Also, the aging of the labor force has reduced the salary advantage of

Box 4. Employment Policies for Older Workers

In the 1970s and early 1980s, the government focused on encouraging firms to raise their retirement age limits to at least 60 years. With the passage in April 1986 of the Law Concerning Stabilization of Employment for Older Workers, the emphasis shifted to raising age limits to 65 years. Actually, the 1986 law has three major components: (1) promotion of continued employment up to age 65, working from a base of 60; (2) promotion of reemployment of "retired" workers; and (3) assistance in preparation for retirement and job placement programs for older workers.

Although the Diet rejected a tougher version of the law in which mandatory retirement below age 60 would have been illegal,[1] the law does stipulate that a firm that sets a below-60 retirement age must give proper cause, such as poor business performance. If there is not a good reason, the firm will be given "administrative guidance" by the Ministry of Labor in developing a plan for raising the age limit. Those who do not comply will have their names made public. Firms are also encouraged to ensure that at least 6 percent of their regular employees are aged 60 to 64. Incentives of 20,000 yen (US $160 using a late 1988 exchange rate of 125 yen per dollar) per month will be given to firms for each worker aged 60 to 64 exceeding the 6 percent target. Similar subsidies will be given for workers whose employment is continued beyond an official age limit of 60.

Measures for promoting reemployment of older workers also include subsidies to employers who hire employees ages 60 to 64 through Public Employment Security Offices. One-fourth to one-third of the newly hired older employee's wage is paid for one year, depending on the size of the firm. There are also lump-sum bonuses that can range up to nearly $5,000 for each worker hired within 3 months of retirement through the out-placement effort of the previous employer.[2] Once again, the Ministry of Labor may give guidance to firms to help them formulate plans for reemployment programs.

Finally, subsidies are given to firms for training middle-aged and older workers in preparation for retirement, and the government is supporting in each municipality Silver Human Resource Centers, which are voluntary organizations set up to assist older workers in finding part-time and temporary jobs. There are already over 300 of these centers, which specialize in low-level jobs such as supervising parking lots, cleaning parks, and distributing leaflets, with pay of about 30,000 to 40,000 yen (US $240-$320) per month.[3]

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3. Kamata, Satoshi, "Life After Retirement," *Japan Echo*, Vol. 15, Special Issue (1988) p. 33.

more senior workers, although general economic conditions, among other factors, also influence the relative salaries of younger and older workers.[35] Some firms, large employers in particular, have also begun offering early retirement incentives, even as they have raised their age limits. Only about 4 percent of firms with 30 or more employees offered such incentives in 1986, but over half the firms with 5,000 or more employees, and 40 percent of firms with 1,000-4,999 employees offered early retirement incentives.[36]

Reemployment and Unemployment

In spite of the relatively low age limits and some incentives to retire early, a substantial proportion of older Japanese continue to work. Of those not working, many would like to work: 63 percent of those 55-59 and not working, 55 percent of those 60-64, and 39 percent of those 65-69 would like to work, according to a 1983 Ministry of Labor survey.[37] How can they find jobs after they have "retired" or reached the age limit?

In 1986, almost 70 percent of firms with 30 or more employees had systems for reemploying or extending the employment of the elderly.[38] The employee, however, usually must agree to a cut in pay, a loss of title, and no guarantee of continued employment. In the largest firms, employees reaching or approaching the age limit are frequently reemployed in subsidiary firms. This practice of transferring older employees is manifested also in moves from government agencies to contractors' firms, in which case the transferees are known as *ama kudari* or people who have come down from heaven.

Employees of smaller firms, as well as the substantial number of workers who have never been part of the lifetime employment system, have far fewer options. Often these workers must not only change jobs, but also change industries or occupations in order to find employment. Extended periods of unemployment are not uncommon. Among the unemployed ages 55 and over in 1986, 28 percent reported having been unemployed for more than 1 year and 31 percent for 6 to 12 months. Among the unemployed of all ages only 17 percent were without jobs for more than a year and 22 percent for 6 to 12 months.[39]

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The excess demand for younger workers and excess supply of older workers have created imbalances in Japan's labor force.

The difficulties that older Japanese have in finding jobs are also reflected in the age pattern of unemployment rates. The overall unemployment rate in Japan remains low relative to other developed countries, even when differences in measurement are taken into account.[40] In 1987, Japan's unemployment rate was 2.8 percent, less than half that of the United States (6.2 percent). Older Japanese males, however, had higher unemployment than did American males, particularly the 60-to-64-age group in which 7.6 percent of Japanese males were unemployed, whereas only 3.6 percent of American males were.

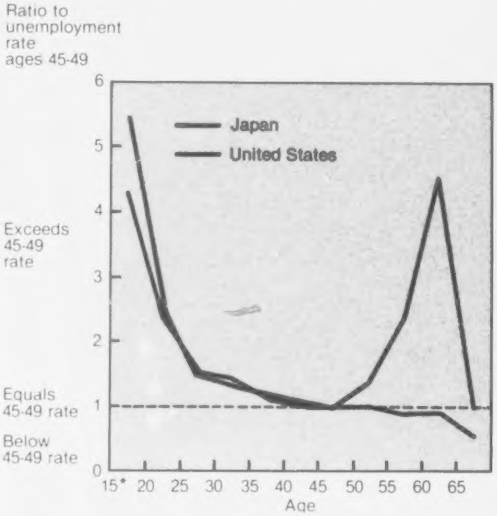
One way to assess the unemployment problems of the elderly within a country is to compare their rates with those of an age group that typically has low employment: the 45-49-age group. Figure 8 shows the ratio of the unemployment rate by age to the unemployment rate for the 45-49 group for males in Japan and the United States.

Even though there may be slight differences between countries in the calculation of unemployment, it should be noted this index by age is calculated relative to unemployment in each country and thus provides a means of comparing age patterns of unemployment across countries. Up to the late 40s, the age patterns of unemployment of males in Japan and the United States are remarkably similar. Unemployment is relatively high at the youngest ages and then declines.

Above age 50, however, the age patterns diverge considerably. In the United States, unemployment continues to decline with age, but in Japan, there is a new peak of unemployment in the 60-64 group, where the unemployment rate is 4.5 times that of the 45-49 group. Even though Japan's overall unemployment rate is relatively low, unemployment affects the elderly in Japan much more than in the United States.

The excess demand for younger workers and excess supply of older workers is reflected in the Public Employment Security Offices' ratio of job openings to job applications for regular positions by age. In 1986, there was only 1 opening for every 10 applicants in the 55 and older group, compared to 7 to 11 openings for every 10 applicants in the age groups between 20 and 35. For those 19 and younger, there were 14 openings for every 10 applications.

Figure 8. Ratio of Unemployment Rate by Age to Unemployment Rate for Those 45-49, Japan and the United States, Males, 1987



* For the United States, 16-19.

Sources: Japan Statistics Bureau, *Annual Report on the Labour Force Survey*, 1987 (Tokyo, 1988); U.S. Department of Labor, *Employment and Earnings*, Vol. 35, No. 1 (January 1988).

Another indication of the imbalance between supply and demand for the various age groups of workers is the rather extreme behavior of some firms in attempting to hire younger workers. Each year in September, firms can begin interviewing potential recruits who will graduate from college the following March. According to the Ministry of Labor's system, formal job offers are not to be made until October.

Because new graduates are in such great demand, in another recent development, some companies in 1988 used somewhat coercive tactics to keep the young people that they wanted to hire from having any contact with other firms. These tactics ranged from "daily detainment" for discussions at the company to trips to resorts in Japan or abroad.[41]

The experience of 1988 may have been exceptional since a number of firms found they had gone too far in slowing the growth of their work forces, expecting that the high price of the yen on international markets would erode the demand for exports. Also, the college graduates of 1989 are a relatively small cohort since they were born in 1966, which, according to the traditional Japanese calendar, was the year of the fiery horse. Births were greatly reduced that year because of the superstition that females born then might kill their husbands.

Employers will have a larger pool of potential workers in the early 1990s when the members of the small echo of the short Japanese postwar baby boom begin to enter the labor force. However, in the long run with the aging of the labor force, the imbalances in the labor supply can only get worse unless there are significant changes in the Japanese employment system and changes in attitudes toward older and female workers. In 1985, the 50-64 group made up 28 percent of the population 20-64, the usual working ages. By 2000, according to the government's middle-series population projection, this older group will comprise 34 percent and by 2025, 35 percent of the working-age population.

Economic Well-Being

Despite the relatively difficult employment picture of today's elderly, most are financially comfortable, although they may have fears about whether or not their funds will last until the ends of their lives. When the Japanese respondents in the government's crossnational survey of the elderly were asked how difficult their economic circumstances were, 53 percent said not at all difficult, 31 percent responded a little difficult, and only 16 percent replied quite or very difficult, a pattern similar to the responses of the elderly in Denmark and the United States.

The youngest-old, or those elderly under age 75, played key roles in building Japan's postwar economic success (they were 40 to 49 years old in 1960). They have saved some of their earnings, at least in part, in preparation for their retirement. Nevertheless, it is this group, those approaching old age, who voice the greatest economic concerns. Of Japanese ages 60-64, 21 percent reported their economic situations were quite or very difficult, but among the oldest group, those 80 and above, only 13 percent gave the same answers. Those in the 60-64 group may still be experiencing retirement and employment difficulties, and they face longer lives and more uncertainty ahead of them.

It is difficult to measure the economic well-being of the elderly in Japan because most data from income and expenditure surveys are for households, not individuals, and are published by age of head of household. Given that over half the elderly live with their children, who may be listed as household heads, looking only at data for households with elderly heads may not accurately portray the situation of the elderly.

In 1986, household data did show that, among households headed by persons ages 65 and over, the average annual income was only 82 percent of the income of all households, and the elderly-headed households had only 1.02 earners per household in comparison to an average of 1.56 earners in all households.

Their assets were actually greater than average, valued at 148 percent of the national household average. Their liabilities were less, only 33 percent of the national average.[42] In particular, households with elderly members are more likely to own their own homes, according to 1985 census data.

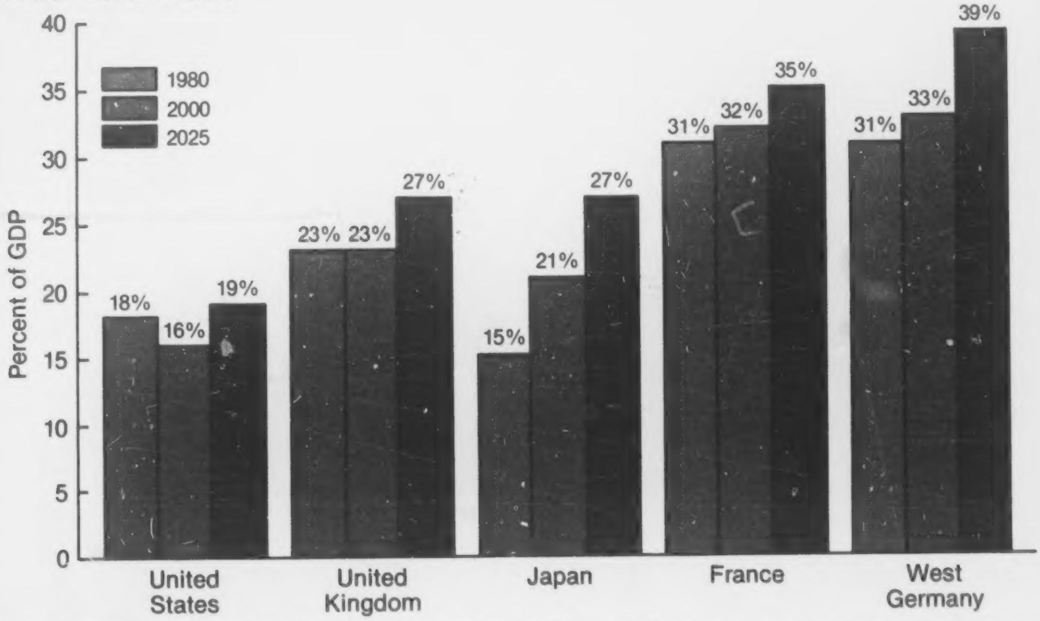
The public pension system is becoming increasingly important to the economic well-being of Japan's elderly. Between 1981 and 1986, the proportion of Japanese ages 60 and over reporting that a public pension was their major source of living expenses increased from 35 to 53 percent. The proportion of elderly relying most on earnings income fell from 31 to 25 percent and the proportion depending on children dropped from 16 to 9 percent.[43]

Social Expenditures

Although the proportion of national income that is devoted to social welfare in Japan is low in comparison to most other developed countries, it is increasing steadily. For example, in 1983 the ratio of social expenditures for persons of all ages (including medical care) to national income was 14 percent in Japan in comparison to 18 in the United States, 31 percent in West Germany, and 44 percent in Sweden.[44] Just 10 years earlier, only 6 percent of Japan's income went to social expenditures. By 2025, Japan is projected to spend 27 percent of its gross domestic product on social expenditures, surpassing the proportion spent by the United States and the United Kingdom, but still spending relatively less than West Germany and France, as shown in Figure 9.

Another measure of the increasing burden of social welfare is the ratio of the sum of taxes plus premium payments into the public pension scheme as a percentage of national income. The 1988 ratio for Japan was 37 percent, but it is projected to increase to about 45 percent by 2010, assuming that income grows by 4.0-5.5 percent per annum. The ratio of social security premiums alone to national income is expected to rise from 11 to about 18 percent.[45] These government projections are based on pension and medical care systems that have been revised recently in an attempt to alleviate some of the future financial bur-

Figure 9. Social Expenditure as a Percentage of Gross Domestic Product (GDP), United States, United Kingdom, Japan, France, and West Germany: 1980 and Projections to 2000 and 2025*



*Social expenditures comprise government funds spent on welfare, health care, unemployment benefits, pensions, and similar social programs.

Source: Peter S. Heller, Richard Hemming, Peter W. Kohnert, and a Staff Team from the Fiscal Affairs Department, "Aging and Social Expenditure in the Major Industrial Countries, 1980-2025," *Occasional Paper*, No. 47 (Washington, D.C.: International Monetary Fund, 1986).

dens associated with population aging, but further modifications may be necessary.

Public Pensions

The public pension scheme in Japan underwent a major revision in April 1986. Prior to that change, the majority of pension beneficiaries in Japan were participants either in the Employee Pension Insurance (EPI) or the National Pension (NP) schemes.[46] The EPI was founded in 1941 and covered workers in firms with five or more employees. The NP scheme, established in 1959, covered self-employed workers and employees of smaller firms. The 1986 reform was designed to merge the two schemes, to gradually reduce benefits so the contribution rates in the 21st century would be only three times the present rates, rather than four as projected, and to establish the right of women to pension benefits on their own, not just as dependents of employees.

Under the new scheme, everyone in Japan between the ages of 20 and 60 is a compulsory member of the NP scheme (persons ages 60-65 may choose to contribute to the system). Premiums in 1987 were 7,400 yen or about US $60 per month, and the basic monthly pension under this scheme—for which the age of eligibility is 65 years—was around 52,200 yen or US $420 for someone who had contributed to one of the two original schemes throughout his or her working life. Benefits will be adjusted according to the consumer price index in future years.

As of 1989, employees under age 65 do not pay directly into the NP scheme, but are required to pay into the new EPI, which in turn makes an appropriate contribution to NP to cover the employee's basic pension. The rest of the 12.4 percent (as of 1987) of male worker's regular monthly salary that is collected as a premium (half from the employee and half from the employer) goes into a fund that will be used to pay an earnings-related pension, in addition to the basic pension. The pensionable age is 60 for males, as it was under the old EPI, but the Ministry of Health and Welfare would like to raise the age to 65.[47] It is estimated that the replacement rate of the combined basic and earnings-related pension will be 69 percent, rather than as high as 83 percent without the reform.[48]

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Public pensions are an increasingly important source of income for retired Japanese elderly.

Women under EPI are eligible for benefits at age 55, and their contribution rate was only 11.5 percent in 1987. But male and female contribution rates are to be equalized around 1993 and their ages of eligibility by 2000. There is also a complicated transition formula for benefits that will be used for the next 20 years, so that those between the ages of 40 and 60 in 1986 who expected pensions under the old system can be eased into the new system and adjust their financial planning. Persons who were 60 or over in 1986 will receive benefits calculated under the old system.

Either early or late receipt of pension benefits can be chosen with commensurate decreases or increases in average benefits. Under both the old and new systems, there are earnings tests that reduce earnings-related benefits substantially between the ages of 60 and 65, but the test is eased after 65. Some analysts expect that the pension reform will increase the supply of older workers, especially those wishing to work on a part-time basis, because there is some evidence that pension eligibility affects the labor force activity of older workers.[49]

Increased labor force participation of the elderly, or at least no further declines, would help hold down the ratio of beneficiaries to contributors and reduce the need for increased pension contribution rates. Based on the 1986 reform, the government projects that the premium rate under EPI will increase to 28.9 percent in 2025 from 12.4 percent in 1987. If the Ministry of Health and Welfare succeeds in raising the EPI pensionable age to 65, this ultimate rate will be reduced to 23.9 percent.[50] Of course, raising the age of eligibility may create greater challenges for the Ministry of Labor to encourage employers to provide more opportunities for older workers.

Health Care and Homes for the Aged

The law regarding health care for the elderly has also been revised in an effort to curb rising government medical care expenditures. In Japan, 99 percent of the population has health insurance, most of them, once again, under one of two major systems—one for employees and their dependents (Health Insurance for Employees (HIE), covering 52 percent of the insured population in 1986) and one for self-employed people, retirees, and their dependents (National Health Insurance (NHI), covering 38 percent).[51]

Under HIE, part of which is administered by the government and part by large individual firms or groups of firms, the employer and employee share the cost of premiums, which in recent years has been around 8 percent of the employee's earnings (in 1985, an average of US $1,830). The insured person then pays 10 percent of the cost of medical care received, while dependents pay 20 percent of in-patient costs and 30 percent of out-patient costs. (A Central Social Insurance Council determines standard medical care fees, although some firms may provide supplemental benefits, and supplemental private medical insurance is growing in popularity.) Should the amount paid by the insured as copayment exceed approximately $430 per month, the difference is reimbursed.

Under NHI, which is administered by the government, the average premium payment in 1985 was approximately $325. Individuals are responsible for a copayment of 30 percent of costs for all care for both the insured and dependents. However, as with HIE, monthly copayments over $430 per month are reimbursed.

Given the early retirement age limits in Japan, most of the elderly are insured under NHI, which until 1968 required a copayment of 50 percent for dependents; if the spouse of an elderly person needed expensive medical care, the copayment would mount up. In 1973, the insurance system was revised to limit monthly copayments and to provide free care for those ages 70 and over. Not surprisingly, the utilization of medical care by the elderly increased dramatically after 1973, as did national health care costs. The increases were so great and the burden of elderly care on the NHI program so disproportionate that the health insurance system was revised again in 1983 to require HIE to make contributions to NHI for the care of the elderly and to establish nominal fees to be paid by those ages 70 and over of about $6 per month for outpatient care and about $3 per day for hospitalization. The revision also consolidated and increased health screening programs for degenerative diseases for persons ages 40 and over to promote healthier aging.

Nevertheless, medical care costs (through the health insurance system, excluding private costs) have continued to grow faster than national income. The proportion of the total costs accounted for by the 70-and-over population surpassed 30 percent in 1986, and the per capita medical costs for the elderly were over four times the average.[52] Of special concern are the relatively long hospital stays of the elderly, stemming in part from the propensity of many Japanese physicians to prolong life at any cost.

However, various analysts have also noted that in Japan, hospitals are to some extent used in lieu of homes for the aged.[53] The statistics on living arrangements of the elderly cited earlier confirm that a substantial proportion (2.6 percent of those 65 and over in the 1985 census) are in hospitals. This phenomenon, called "social hospitalization," avoids the stigma attached to institutionalization, which is often equated to the folkloric practice of *obasuteyama* or leaving grandmother on the mountain to die.

In the United States approximately 5 percent of the elderly live in homes for the aged, in comparison to only 1.6 percent of Japanese ages 65 and over. In Japan, three basic types of nonprofit homes for the aged are subsidized by the government. In 1986 these included: 942 homes accepting elderly who can more or less take care of themselves (containing 32 percent of all beds in homes); 1,731

Box 5. Innovative Programs for the Elderly

National programs for the elderly are administered by local governments with subsidies from the national government, but local governments have also been developing their own programs. Taito, a ward of Tokyo, has established an innovative system in which volunteers who help the elderly in their homes earn coupons that can be redeemed for similar aid in the future for themselves or for their relatives.[1] The Tokyo Metropolitan Government is developing a radio transmitter system for the elderly to use in case of emergency, but so far only 710 out of 138,000 elderly who live alone in Tokyo are included in the system.[2] Perhaps most famous is the program of Musashino City, a suburb of Tokyo, which provides care until death for the elderly who use their property as collateral for service costs.[3] Upon their deaths, an appropriate share of the proceeds from the sale of their property goes to the program.

One very controversial proposal has come from the national Ministry of International Trade and Industry—exporting the elderly. Known as the "Silver Columbia Plan," the idea was initially proposed in 1986 by a government official who had just returned from a posting in Spain, where he noted Japanese retirees' yen would buy a lot of services. Under the plan, the overseas silver towns were to be constructed by private companies and were to be ready for occupancy by elderly Japanese in 1992, the 500th anniversary of Columbus' landing in America. Besides Spain, various Asian countries and Australia were mentioned as possible destinations, but there was considerable public outcry in some of these countries against the idea of enclave settlements and potential colonization by the Japanese. The ministry has now withdrawn the proposal, but is considering a new plan to ask foreign countries to give extended tourist visas to Japanese and to encourage Japanese companies to build leisure facilities abroad.[4]

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homes for the bedridden (with 60 percent of beds); and 286 homes with moderate fees for those with limited income (8 percent of all beds).[54] The total number of homes increased by almost 50 percent between 1980 and 1986. Nevertheless, there is still an excess demand for placement in homes, especially in urban areas. Also, it is not clear whether or not hospitalization would decrease if more space were available in homes for the aged.

The 1983 health insurance reform did attempt to promote more care for the elderly outside hospitals through programs of health advice upon discharge from the hospital, home visits by nurses, physical therapy, and day care for the mentally impaired, but shortages of trained personnel have seriously limited the actual provision of these public services. Private health services to the elderly in their homes have also been slow to expand, in part because of the resistance of some physicians, who have a vested interest in hospital-based services.[55]

As was noted in the discussion of senility in Box 2, page 12, the stresses on caretakers of the elderly at home can be considerable. In 1986, in recognition of these problems, the government announced the goal of increasing the number of day care centers for the elderly from 500 to 3,000 in the near future and to 10,000 in the long run. There has already been some progress in the provision of home helper services in Japan. Between 1970 and 1987, the ratio of the number of home helpers to persons 65 and over improved, from 1 per 1,210 to 1 per 530. Furthermore, both local and national governmental agencies are trying to develop new ways of caring for the elderly (see Box 5).

Nevertheless, the various levels of government will need to move quickly to cope with the rapid growth of the elderly population in need of health care or assistance in their daily lives. Naohiro Ogawa, an expert on the economics of aging and health care in Japan, has projected that the share of the 65 and over population in total medical expenditures under the two major systems will increase from 35 percent in 1986 to 43 percent in 2000 and to 55 percent in 2025.[56]

Using a complex economic-demographic model that allows for changes in the labor force participation of females, who are the usual caretakers of the frail elderly, Ogawa projects that the ratio of the number of elderly who are bedridden or who suffer from senile dementia to the number of women ages 45-54 who are not working will increase from 0.4 in 1985 to 0.6 in 2000 and to 1.2 in 2025.

Economic Implications of Aging

The implications of aging for economic growth can be understood by considering the influence of aging on the two basic inputs to economic output: labor and capital.

Labor

Without a doubt, the Japanese working-age population will be older in the future, and if labor force participation rates at each age remain constant, then the labor force will age. But rates are likely to change, especially for the elderly and for women. Rates for the elderly will be influenced by health, pension availability, employment policy and opportunities, and preferences for leisure. If Japan follows the path of other developed countries, however, the labor force participation of the elderly will continue to decline. On the other hand, it is widely expected that female labor force participation will continue to rise in Japan. Thus, the declining labor force activity of older Japanese and increasing activity of women should help to offset the aging of the working-age population.

Little is known about future labor force participation rates, but even less is known about the implications of aging for the quality of the labor force. As a result of increasing educational attainment, each new cohort of workers enters the job market with more training than the previous one. Because of the aging process, the proportion of younger and presumably better-trained workers in the total labor force will decline in the future. Nevertheless, each new cohort of older workers will be better educated than the last, and the aggregate quality of the labor force should continue to improve over time. Also, given the importance of on-the-job training in the lifetime employment system, the older workers within that system embody significant amounts of company-specific human capital.

Although older workers everywhere are thought to have a slower reaction than younger workers, they may compensate for that weakness with better judgment. One 1978 study of 600 firms in the machine industry in Japan found that workers ages 60 and over generally could perform all of their duties satisfactorily, and supported the view that differences *within* age groups in capacity may be greater than differences *between* age groups.[57] Moreover, the older worker of today is considerably stronger and healthier than the older worker of the past. The challenge for employers is to tailor jobs and promotion hierarchies in such a way as to take advantage of the older worker's strengths while at the same time allowing advancement opportunities for younger workers.

Japan could also attempt to meet future labor force needs through increasing either the birth rate or the immigration rate. As discussed in the section on fertility, however, higher birth rates seem unlikely. Ten years ago, increases in immigration seemed equally unlikely, given the homogeneous and somewhat xenophobic nature of Japanese society.

Nevertheless, the number of foreign workers in Japan is increasing. The number of legal foreign workers was 54,736 in 1986, up from 42,806 in 1984, but over 82 percent of them were entertainers and athletes. Only 12 percent were employed in trade, business, or investment in 1986, down from 16 percent in 1984.[58]

Surveys indicate a growing acceptance of skilled foreign workers, but they remain occupationally segregated. Japanese are generally quite reluctant to allow unskilled workers into the country without strict limits on their stay and activities.

In 1987, 11,000 illegal workers were apprehended—the typical apprehended illegal alien was a Filipino woman working as a so-called entertainer. However, estimates of the total illegal work force ranged as high as 60,000.[59] As a result, efforts are being made to tighten visa requirements and inspection by airlines and immigration authorities.

A more likely source of labor will be through the increased use of robots. Although Japan still lags behind Sweden in the ratio of robots to industrial workers—10.7 versus 17.0 per 10,000—it is ahead of the rest of the world, including the United States, where the ratio was 2.3 robots per 10,000 workers in 1985.[60]

Savings and Investment

Although economists may debate the best way to measure savings and whether or not Japanese statistics are comparable to those of other countries, by any measure, the Japanese savings rate is higher than those of most other developed countries, though it has been declining steadily since the early- to mid-1970s. The explanations suggested for Japan's relatively high rate include limited public pensions, the high costs of education and housing, the biannual bonuses, tax incentives, rapid economic growth, and culture, but no consensus has emerged.

Given the lack of consensus about why Japan has such a high savings rate, it is even more difficult to predict how population aging will affect it, although the 1985 Economic White Paper forecast that the savings rate will be cut in half in the next century. According to life-cycle saving theory, workers save while they are young, but then in retirement they dissave, i.e., they live off their savings or draw them down. Studies of the elderly in Japan, however, reveal that they do not necessarily follow this pattern.[61] Analysis of their economic behavior is once again complicated by the fact that they frequently live with the younger generation. But even controlling for coresidence of parents and children, there is some indication that the elderly continue to save in retirement. One possibility is that they want to make bequests to their children, but another is that they are uneasy about the future: how long and under what conditions they will survive.

However, if retirement life is shortened by increased labor force participation of older Japanese, then the savings rate may decline. Increased taxes and contributions to the public pension system may also reduce savings among Japanese of all ages through decreasing disposable income or through lessening the motivation to save for retirement.

There is also debate about the implications of aging for Japan's balance of payments, particularly through overseas investment. The 1985 Economic White Paper argued that Japan's capital exports will fall as a result of the decline in savings. But no matter what happens to overall savings, many economists expect that an increasing proportion of capital accumulated will be sent abroad. The relative returns to capital invested in Japan will decline, as the capital-labor ratio increases in response to the effects of aging on the supply of labor, so investments in countries with cheaper, more plentiful labor will be attractive.

Of course, overseas production is already important to Japan. Part of its current direct foreign investment is in response to the need for cheaper labor, but it is also an attempt to circumvent trade barriers and to locate production closer to markets. Japanese investment in the United States takes both forms. With the strength of the yen, even American wages look relatively low. The result is that exports are reduced, assuming that not too many component parts and not too much production equipment are shipped overseas from Japan for fabrication, and imports are increased to the extent that some of the finished products made overseas are imported to Japan. Thus, the trade surplus is reduced, and capital outflows further reduce the overall balance of payments.

Increased production overseas has its own implications for labor in Japan—less is needed. Although at the macro level this result helps alleviate labor shortages that might be a consequence of population aging in the long run, in the short run jobs are lost, economic restructuring must take place, and unemployment may increase. The Ministry of International Trade and Industry has predicted a loss of 800,000 employment opportunities between 1986 and 2000, assuming that direct foreign investment grows 14 percent per year, a modest assumption in view of recent history.[62] Employment adjustment measures, primarily restrictions of overtime work and increased transfers, thus far have been greatest in the manufacturing sector, especially in machinery-related firms and less so in consumer goods-related firms.

Economic-demographic models that account for many of the above factors generally support one basic conclusion: With slower growth of the labor force and capital accumulation and a restructuring of the economy towards the less productive service sector, the growth rate of the economy will slow, but by how much depends on a variety of assumptions.[63] Nevertheless, one should never underestimate the strength and flexibility of the Japanese economy, as exemplified by its remarkable response to the high value of the yen and pressures to reduce exports in the late-1980s.

Since mid-1987 Japan's economic growth has been more and more based on increased domestic demand for high value-added products. Who knows what the advent of increased leisure and richer elderly will mean for the development of a "silver" market? If Japan continues to succeed in restructuring its economy, then its economic growth may stimulate continued capital accumulation and provide greater resources to help pay the costs of its aging population. A growing economy can cure a variety of ills.

The Elderly and Japan's Future

Evaluating the Present

The situation of the elderly in Japan was compared to the glass of water that is either half full or half empty. For the Western elderly looking at the Japanese situation, the glass may look half full, given the longer life expectancy, the higher incidence of living with children, and, at least for Americans, the more generous medical insurance program for Japanese elderly. Although opinion surveys indicate that most Western elderly prefer intimacy at a distance, one never knows for sure whether or not such responses are simply rationalizations after the fact. Westerners, however, may be surprised to learn that many Japanese workers are forced to retire at a relatively young age, some experience lengthy periods of unemployment, and even though a smaller proportion live in nursing homes, an extended stay in the hospital may be the alternative.

Individual elderly Japanese, however, may not care very much about international comparisons. They may be more concerned about how the lives of the elderly have changed over time in Japan, and how their current situation compares to their expectations of old age. On the minus side, fewer Japanese, who do indeed prefer living with their adult offspring, do so than in the past. Moreover, in a modernized, industrial society, it is difficult for the elderly to continue working, given institutional constraints. On the plus side, however, is a longer life and much improved pension and medical insurance schemes (although elderly 20 years from now will have lower pension benefits as a result of the 1986 reform). Also today's elderly are better educated and richer than yesterday's, improvements that should continue well into the future.

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For better or worse, the lives of Japanese elderly will continue to change.

Social scientists may argue about whether the elderly have lost status or respect or whether they are less integrated into society than in the past. These debates are hard to settle. Let it simply be said that things have changed—for better or worse—and that they are likely to continue to change. Adaptation may be particularly difficult for the current generation of elderly, a transitional cohort that has witnessed tremendous demographic, social, and economic change in their lifetimes, and accordingly, may feel greater uncertainty. Perhaps the next cohort will be better prepared for the realities of old age.

Future Effects of Aging

The particularly rapid pace of aging in Japan and the associated potential difficulties have captured the attention of policymakers and officials to an extent unequaled in the United States. A noted government report, *Japan in the Year 2000*, highlighted population aging along with internationalization and the maturation of the economy as the three greatest challenges facing Japan in the 21st century. The prime ministers of Japan have regularly referred to aging as they have set the policy agenda. Former Prime Minister Noboru Takeshita particularly noted the need for further review of the national health insurance system and pension schemes and for improved nursing homes for the aged, given population aging. He also used aging as a rationale for his party's recently enacted tax reform, which lowered income taxes, but instituted a consumption tax, thus shifting more of the costs of government programs to the elderly.

Of particular concern to policymakers is the perception that the government increasingly is being expected to play a larger role in the care of the elderly, while the individual elderly person and families play smaller roles. The pension, medical insurance, and tax reforms have all been designed to shift the balance somewhat away from the government. Furthermore, the 1987 White Paper on Health and Welfare emphasized the importance of home care of the elderly and stressed the importance of family members as caregivers.

Increasing the role of the family in Japan, however, generally means increasing the burden on middle-aged women. At the same time that the government would like them to take greater care of the elderly, women are being relied on increasingly in the labor force, especially as part-time workers. In the simplest terms, the choice would seem to be that either they can stay home, reduce the need for public services, and let the economy grow more slowly, or they can go to work and increase the need for services, but boost the economic growth rate and pay a greater share of taxes and public pension premiums. Which would be more fulfilling to the individual woman is open to debate.

In any case, many of the best analysts are pessimistic about to what extent responsibility can be shifted from the government to families. Besides increased female labor force participation, there is less co-residence of elderly and adult children, and the stresses on family care can be great. As Daisaku Maeda states, "The term 'family care' has a beautiful and noble connotation, but, in many cases, it is accompanied by the painful sacrifice of the caretakers, and the quality of care is frequently poor."[64] Japan, given population aging, may find it necessary to develop programs to aid its citizens on the basis of need, as may the United States, rather than defining eligibility solely on the basis of age.[65] Age-based programs may not be financially sustainable in the long run, yet the needs of the elderly and their families for assistance should be recognized.

Lessons for Other Countries

What can be learned by other countries from Japan's experience with aging? Asian countries are particularly eager to see if there is a model for aging that differs from that of the West, which is perceived to have abandoned its elderly.[66] Are the adoption of Western values of individualism and materialism and the loss of familism concomitant with economic development and the completion of the demographic transition? The answer for Japan, as discussed above, would appear to be mixed. Things have changed, but the Japanese case is still significantly different from that of other developed countries.

Developed countries share many of Japan's concerns, most obviously those about the increasing costs of public pensions and health care. However, the importance of synchronizing retirement ages and ages of eligibility for pensions and understanding the implications of differences in them as incentives to work or not work is also universal. The trend toward earlier retirement is being welcomed in some European countries as a means of alleviating unemployment problems, but such changes may be counterproductive in the long run, once economies are restructured.

Although Japan, with its low retirement age limits and high unemployment of older workers, cannot be viewed as a model, at least it is making progress in raising retirement and eligibility ages and at the same time providing incentives to employers to hire older workers. Elderly Japanese with their apparently strong work ethic have been willing to make sacrifices to continue working. It is not clear with the greater love of leisure in the West, whether or not older workers would be willing to do the same, but incentives could be provided.

Given the inexorable progress of population aging, it would seem that revisions of definitions, attitudes, and expectations with regard to old age are necessary not only in Japan, but everywhere, among people of all ages. We are all facing a new era in human history that represents the success of efforts to allow people to control their fertility and to live longer. Japan, as a result of its rapid demographic transition, is facing the challenge of accommodating this new demographic reality earlier and with greater urgency. Nevertheless, given its resiliency and ability to adapt, the graying of its population need not spell decline. □

4、物品の販売および勧誘行
5、出店および露店
6、火災等災害の起因となる行
7、その他、群衆等通行上支障と
なる行為
上記行為は禁止されています
東 京

T. Sasaki

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Discussion Points

1. Outline Japan's demographic experience in the 20th century. Compare it to the demographic experiences of other developed countries.

2. Compare Japan's current and projected population age and sex structure to those of other developed countries. How will they change between now and 2025? How does the make-up of the elderly population affect public policy?

3. How have changes in mortality patterns in Japan affected the demand for health services?

4. How have the interaction of Japan's fertility and mortality resulted in the current population structure? What are the prospects for the future?

5. Compare and contrast the lives of Japanese and American elderly in terms of residence, labor force participation, health, economic well-being, and leisure time.

6. There is a growing concern about care for the elderly in Japan. Debate the benefits and drawbacks of increased government care versus continued family support from both the government and individual viewpoints.

7. Describe the measures being taken by the government to ensure an adequate labor supply. Evaluate their progress.

8. Describe the elderly's income sources (e.g. pension, wages, etc.) Compare these to income sources of America's elderly.

9. There have been questions raised concerning the U.S. Social Security System's ability to support the elderly in the 21st century. What is the outlook for Japan's public pension and medical care systems? How will these changes affect the working-age population?

10. What are the benefits and drawbacks to using Japan as a model for aging in other developed and developing countries?

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